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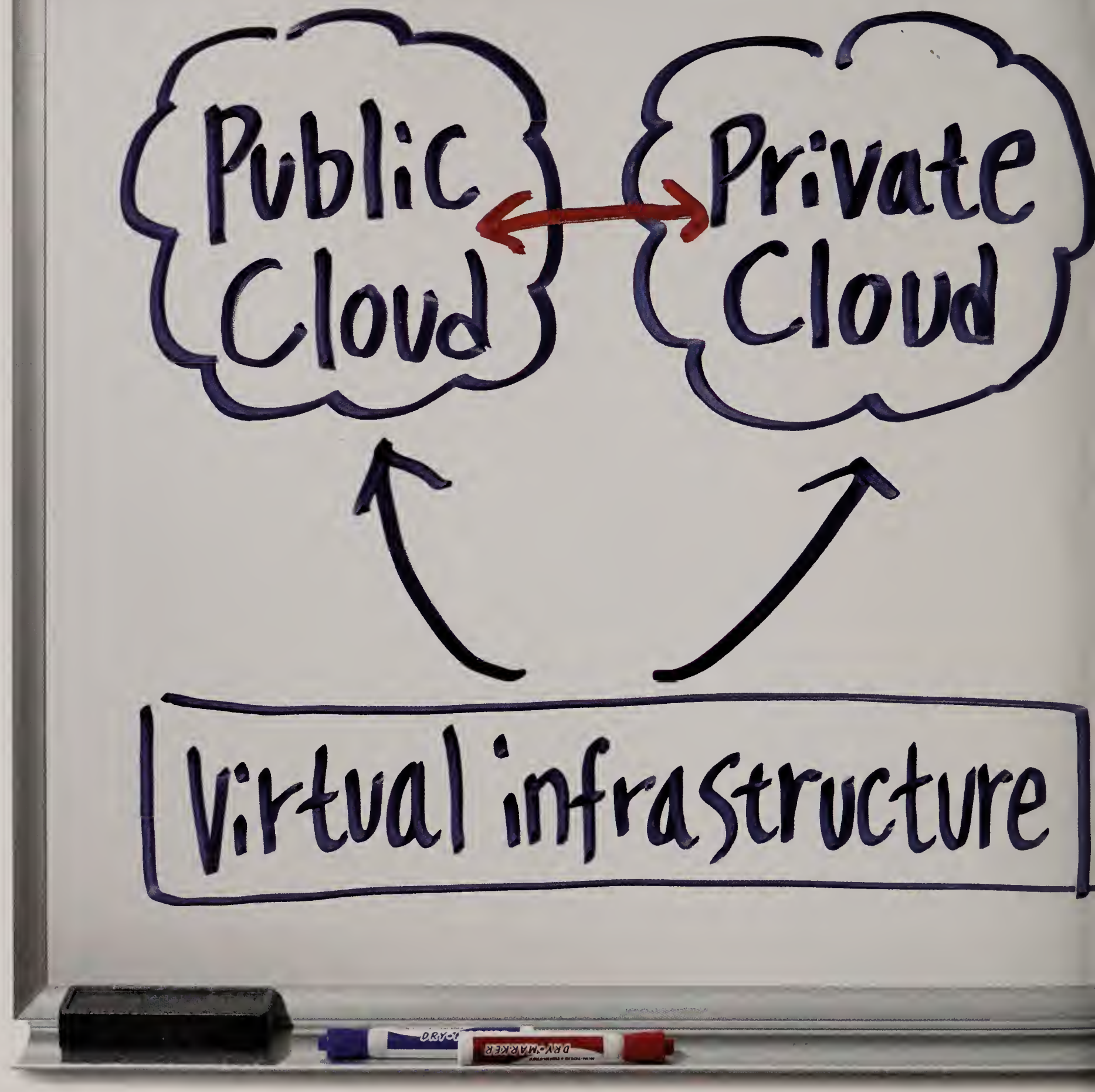

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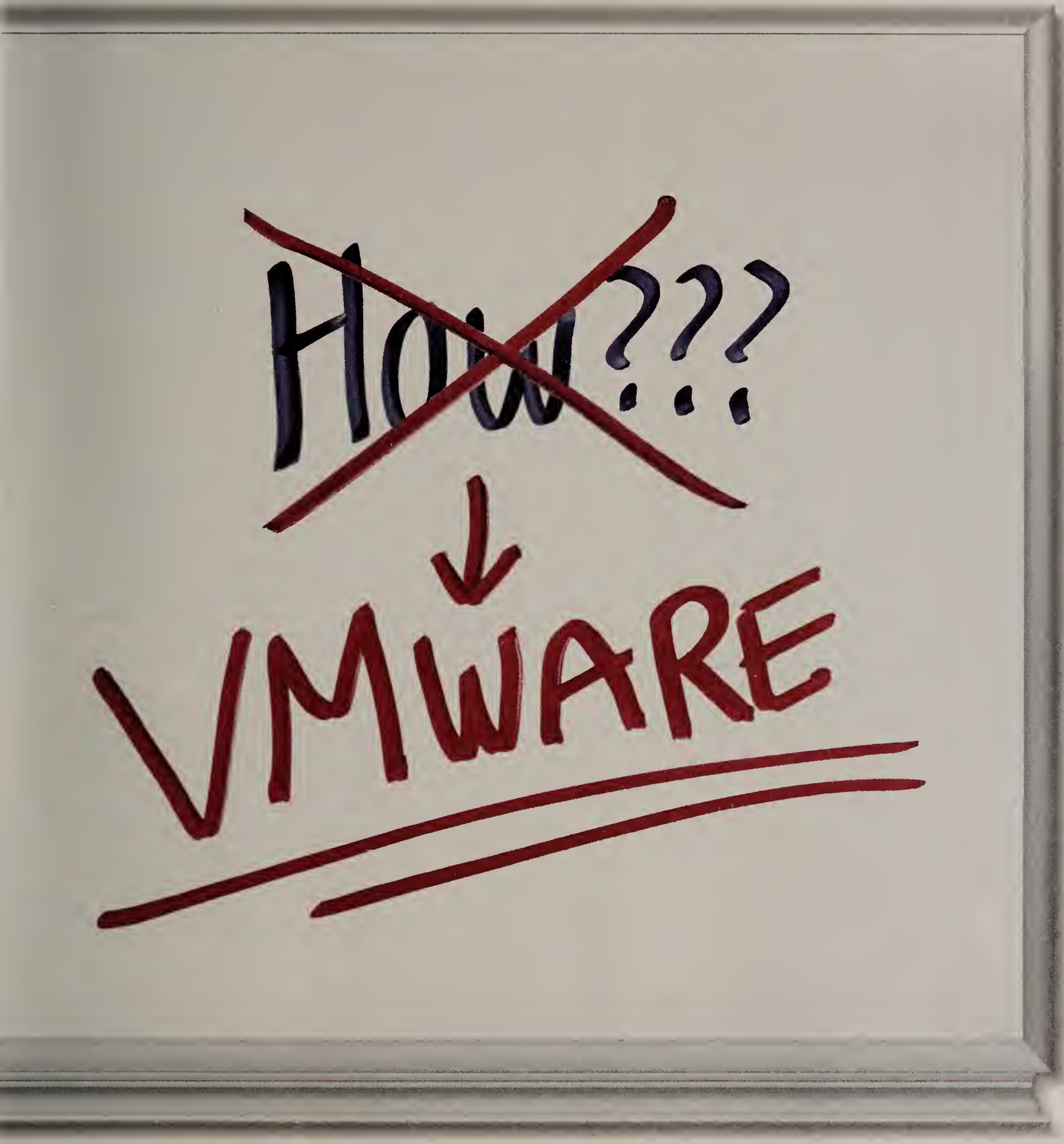

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SPOTLIGHT | STORAGE

Disaster Recovery on Double Duty

20 Virtualization and replication technologies protect data from disaster, while keeping business services humming.

Who Holds the Keys?

28 Encryption isn't bulletproof if keys and digital rights are left out in the open. Here's how to lock down stored data.

Big Fish, Little Pond

32 Despite budget constraints and limited resources, being an IT leader in a small shop has its benefits, including agility and a greater ability to influence the business.

HEADS UP | 6 The **Encyclopaedia Britannica** forgoes print and opts for an online-only future. | **National Geographic** chooses the public cloud for multimedia storage. | **8** Downtown San Jose may offer **high-speed Wi-Fi** by summer's end. | Marvel Comics announces a **new mobile app.**

NEWS ANALYSIS | 10 White House CIO Brook Colangelo strives to modernize an aging IT infrastructure. | **12 Microsoft** cuts the price of Office 365 to stave off Google Apps competition.

OPINIONS | 18 Paul Glen says new managers lack the language to understand the value of management itself. | **42 Steven J. Vaughan-Nichols** doesn't expect VMware to exist in a few years. | **48 Scot Finnie** ponders the inevitability of tablets as PC replacements.

DEPARTMENTS | 14 The Grill: Internet pioneer David D. Clark | **40 Security Manager's Journal:** Validating priorities at RSA | **44 Career Watch** | **46 Shark Tank**

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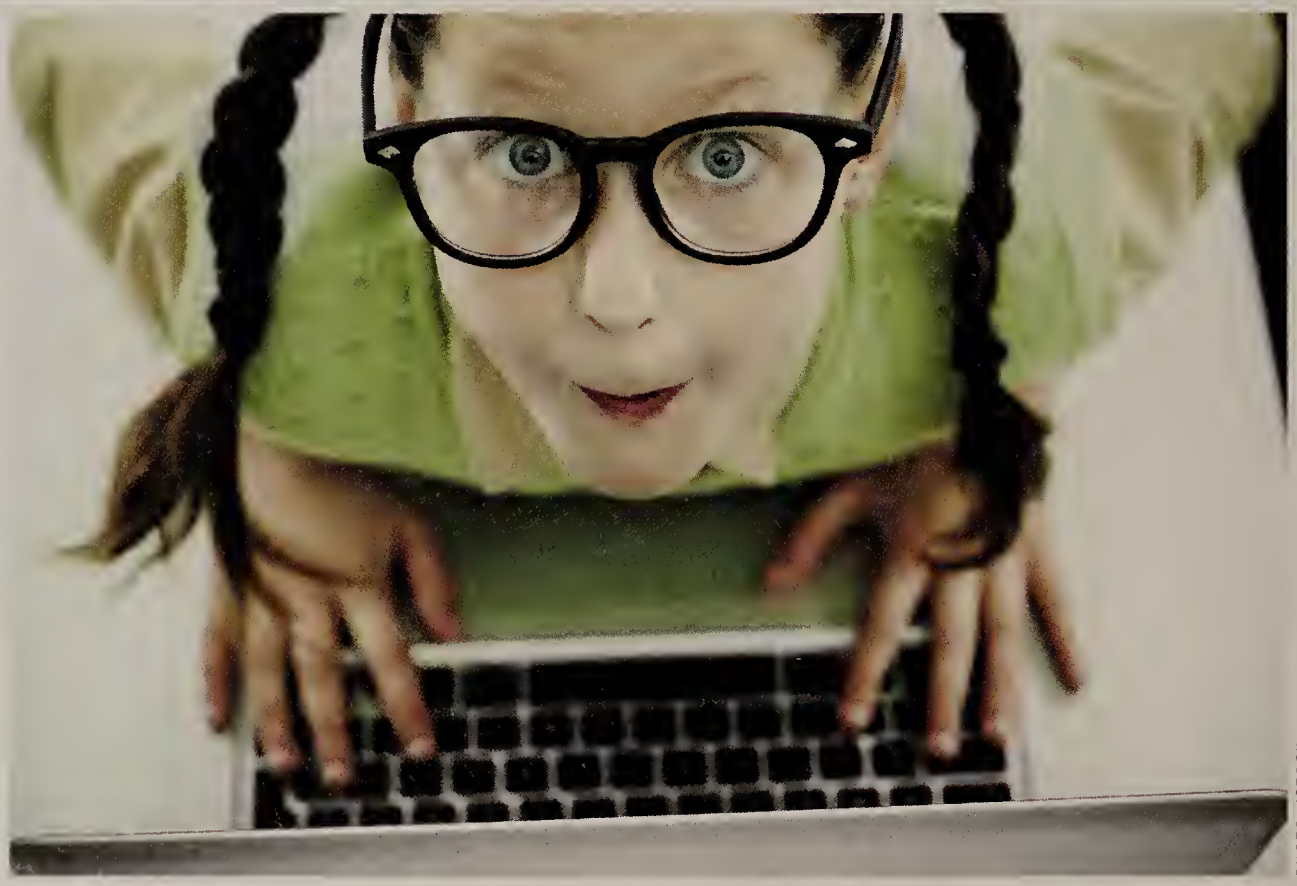

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E-BOOKS

Encyclopaedia Britannica Now Online Only

AFTER 244 YEARS, the Encyclopaedia Britannica will cease to publish its flagship line of reference books and will concentrate instead on its digital offerings.

"We'd like to think our tradition is not to print, but to bring scholarly knowledge to the people," said Jorge Cauz, the company's president.

Britannica has printed the encyclopedia since 1768. The 2010 edition, which was published as a 32-volume set, was the last one in print; there are still 4,000 sets of that edition for sale. Some 2 million sets have been printed through the entire run of the encyclopedia.

Over the past few years, the print edition has accounted for less than 1% of the company's revenue. "The market is not there," Cauz said.

The online edition costs a lot less, with a basic subscription running at $17 per year or $1.99 per month, compared to $1,395 for the 32-volume print version. The company has been offering online editions of its encyclopedia for 20 years, with more than 65% of its online sales coming from educational institutions; the online edition is updated constantly.

The goal now, Cauz said, is to expand its appeal to consumers. With that move, Britannica is taking on Wikipedia, the free online encyclopedia written entirely by volunteers.

"The value proposition in our case is to be a reliable source," Cauz said. "The print set can't bring that reliability because it gets obsolete so quickly and because it doesn't have all the material that is online."

– Joab Jackson, IDG News Service

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CLOUD COMPUTING

NatGeo Moves Media Archive to Public Cloud

The National Geographic Society announced that it will now back up and archive its large unstructured multimedia files on Nirvanix's Cloud Storage Network. Physical storage upgrades, along with the data migration process, have become too expensive and unwieldy, the organization said; it expects to save money in the six-figure range by not having to invest in any further upgrades.

The 124-year-old society said its archive is on the order of 100TB today but will reach the petabyte level in the near future.

An advantage of using a cloud service is that it will improve National Geographic's ability to collaborate with video editors around the globe. "There's no question that it's the kind of thing we'd look to leverage in the future," said Dan Backer, director of infrastructure systems. "You want to hire the best possible video producer you can find. If that video producer is in New York City and the data is in Washington, D.C., there's going to be a transfer problem."

Backer said benchmark tests showed upload performance in the cloud is about the same as it is on-site.

Another benefit, Backer said, will come from new opportunities to sell the society's cloud-based information by making different "buckets" of content available online.

– LUCAS MEARIAN

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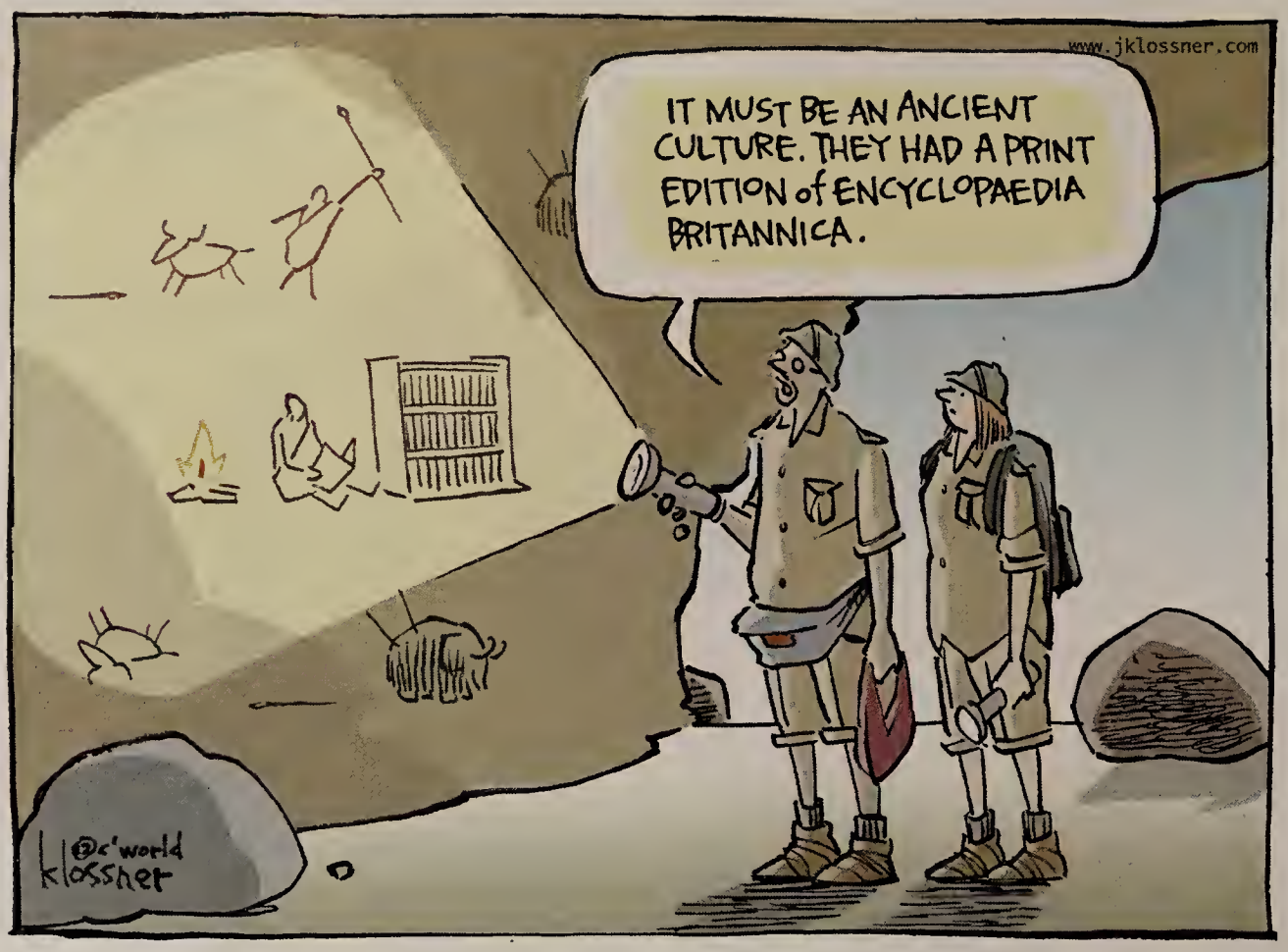
BETWEEN THE LINES
By John Klossner



MOBILE & WIRELESS

San Jose Gives Free Wi-Fi Another Try

THE CITY OF SAN JOSE intends to offer high-speed Wi-Fi throughout its downtown area, with the network paying for itself by making city workers more productive.

The California city, which has a population of about 1 million, plans to deploy Wi-Fi across a 1.5-square-mile area by the end of the summer. But the network will look very different from ones envisioned several years ago.

San Jose and other cities once had ambitious plans to blanket outdoor areas with Wi-Fi; they expected the networks to pay for themselves by generating revenue through home broadband subscriptions, browser-based advertising or small-business network use. But those plans faltered because their complicated business models depended on assumptions that often proved unfounded.

San Jose's current plan is simpler. The network will cost about $94,000 to buy and set up, and then about $22,000 per year to run and maintain, according to the city's acting CIO, Vijay Sammeta. The system will offer improved connectivity for municipal employees and satellite fire stations. It will also provide better connections for wireless parking meters, and for signs that guide drivers to garages using real-time information about the number of spaces available, Sammeta said.

The network will also offer a way for people downtown to stay connected outdoors and in shops and restaurants. One hope is that it will generate foot traffic for small businesses by enticing office workers to venture outside of their buildings.

The public-facing part of the network will be open; people won't have to sign in or provide a password to use it. The municipal network will be secured.

Systems integrator SmartWave Technologies will set up the network using 802.11n gear from Ruckus Wireless. The new equipment will replace a series of hotspots that the city set up with MetroFi in 2004.

– Stephen Lawson, IDG News Service

Micro Burst

GATHERING CLOUDS

Dell says it plans to set up more than

20

data centers in Asia to meet growing demand for public and private clouds.

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EMERGING TECH

Marvel Offers Digital Extras for Comic Book Fans

Marvel Comics next month will release a new application to add content enhanced with augmented reality to some of its comic books.

Augmented reality, or AR, allows computer-generated content to be superimposed over a live camera view of the real world – a street, for instance. There are various ways to do this, but Marvel will use technology from Aurasma that relies on image detection.

The AR app will be available for Apple iPhones and iPads as well as other smartphones and tablets, according to the comic book publisher. By opening the application and holding a device in front of a compatible comic book page, users will be able to unlock free extra content, including new footage and commentary from creators.

Compatible comic book pages will be tagged with an AR logo; they will be featured in titles such as Iron Man, Thor, Captain America, Spider-Man, Wolverine and Hulk.

Last year, 72.1 million comic books were sold in North America. That's a step up from the 69.2 million copies sold in 2010, but well below the 85.3 million sold in 2007.

Marvel said it hopes to enhance the reading experience and add value.

– MIKAEL RICKNÄS, IDG NEWS SERVICE

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*Substantiation: HP white paper, *Measuring the Business Value of Converged Infrastructure in the Data Center*, October 2011

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White House CIO Endures After Tough Start

Brook Colangelo had been on the job just six days when the email servers went down for 21 hours. By Pat Thibodeau

IN BROOK COLANGELO'S FIRST 40 DAYS as CIO of the Executive Office of the President, the White House email system was down 23% of the time while he and his staff put in 80-hour weeks, "if not more."

Colangelo began the job on Jan. 20, 2009 — the day Barack Obama was inaugurated as president. His opening tasks were to "deliver the first presidential BlackBerry" and distribute handhelds to all top administration officials. "It was just a mind-blowing experience," he said at *Computerworld*'s Premier 100 IT Leaders Conference in Phoenix this month.

But reality quickly set in as Colangelo found White House IT assets "in pretty bad shape."

Over 82% of the equipment had reached the end of its useful life. Many desktop computers still had floppy disk drives.

Colangelo also noted that he oversaw just one data center. "We had no redundancy," he said.

The problem became apparent after six days, when, on Jan. 26, "our email servers went down for 21 hours," said Colangelo. "In my professional career, there has not been a worse day since or ever."

Colangelo's luck changed the next morning when he was walking to a 5:30 a.m. meeting to discuss the outage with then White House Chief of Staff Rahm Emanuel. "The most amazing thing happened as [I] hit the door of the West Wing: My BlackBerry started to buzz," meaning the email was back up, he said. "I got to tell you, it was the best feeling I ever had."

The White House faced three or four more outages in the next 30 days or so, and Colangelo launched a massive review of its technology, people and processes.

Internal town halls drew some angry users. "They had floppy drives — I knew what they were going to say," Colangelo said.

A nine-hour email and Internet access outage in February 2011 forced Colangelo to fax updates to Obama while the president was on the road — "not a great thing to do." That incident led to the creation of a data recovery data center with redundant email servers.

The White House IT office has since developed a Web-based portal that lets staff access email and other services from home "in a secure and records-managed way," and it has increased daily data center coverage from eight hours to 24.

The office has also rolled out support for personal tablets and smartphones, increased Internet speeds, rebuilt the WhiteHouse.gov website and cut the number of assets that are nearing obsolescence by more than 50%.

"Our modernization program was very successful," said Colangelo.

Shawn McCarthy, an analyst at IDC who focuses on the government market, said that "government is famous for being both a leader and a laggard when it comes to information technology."

Some governmental groups and agencies, such as NASA, are ahead in technology adoption, while budget worries may force smaller departments to stretch PCs and other IT equipment a few extra years, said McCarthy.

Lack of backup systems and mirroring is occasionally an issue for noncritical government business systems, McCarthy added.

That problem is being addressed through the Obama administration's consolidation effort, which includes the addition of data backup and other protections, he said.

The public sector generally does a lousy job supporting disaster recovery, said Gartner analyst John Kost, explaining that "the business case for some projects excludes it in order to keep costs down to get the project funded." ◆

> "Our email servers went down for 21 hours. **In my professional career, there has not been a worse day since or ever.**" — BROOK COLANGELO, CIO, EXECUTIVE OFFICE OF THE PRESIDENT

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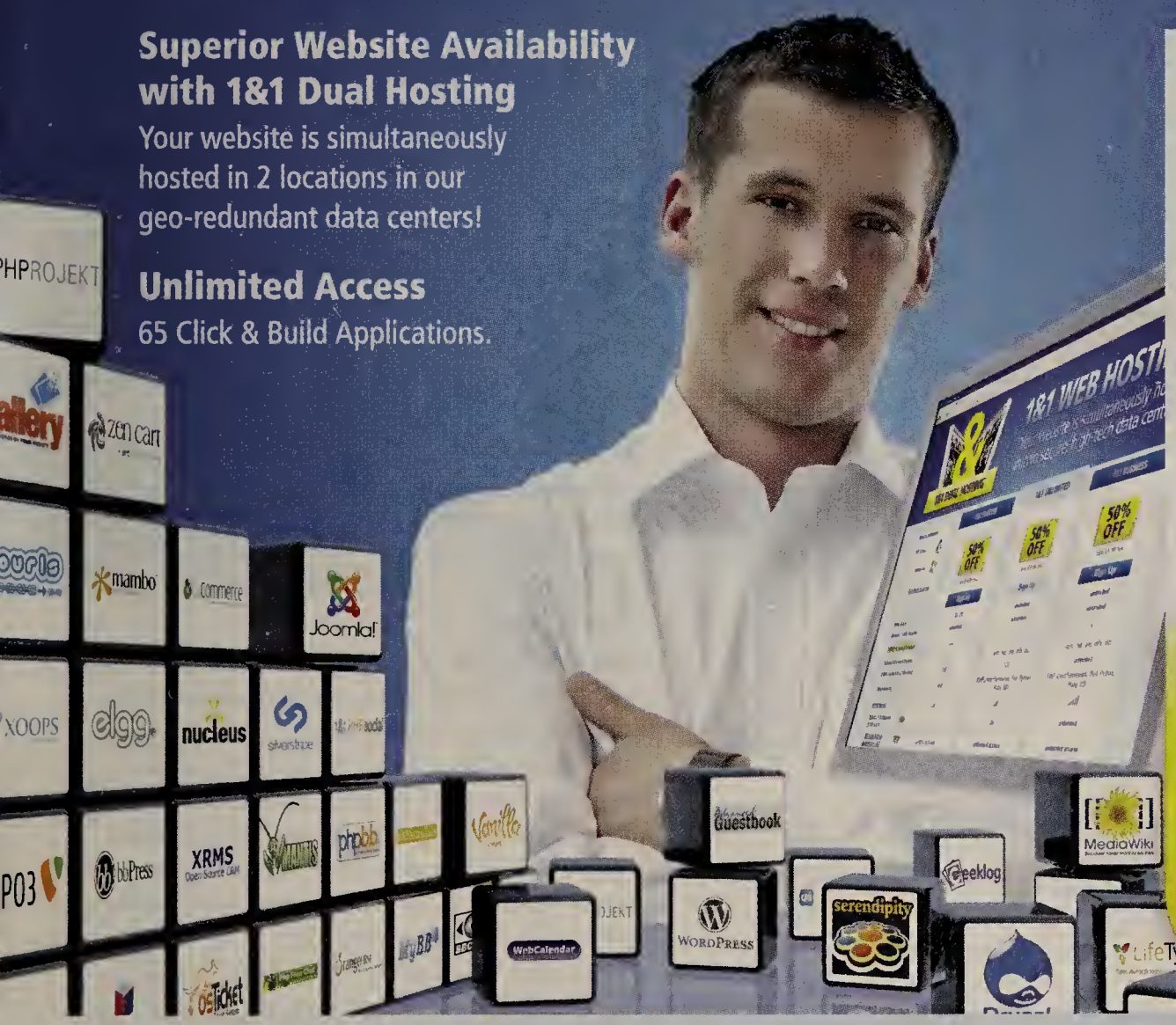

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Microsoft President Steve Ballmer isn't ready to concede the hosted apps market to Google.

Microsoft Moves to Slow Google Apps

Microsoft hopes a quick Office 365 price cut can help it blunt the strong rise of Google's cloud application suite, analysts say. **By Juan Carlos Perez**

MICROSOFT IS cutting the price of its cloud-based service, Office 365, by up to 20%, to improve its chances of success in the enterprise market and to stave off competition from Google Apps, analysts say.

Microsoft itself says the cost of running the cloud suite, which typically includes hosted versions of Exchange, Office, SharePoint and Lync, has fallen and thus the price cut announced earlier this month is simply "passing on" savings to customers.

Nonetheless, Gartner analyst Matthew Cain says it's clear that Microsoft is responding to Google's success in selling its cloud-based services to businesses.

"The price cuts reflect Microsoft's fear of Google," Cain said. "Google Apps for Business has increasing momentum in the enterprise sector, and Microsoft is doing everything they can to prevent further incursions."

Google claims that 4 million-plus businesses are using its hosted application suite, while Microsoft has reportedly claimed that 3 million to 5 million Office 365 user licenses have been sold.

Google Apps has gained some highly publicized large customers for its hosted software suite, including the city of Los Angeles (minus its police department), the city of Pittsburgh and the National Oceanic and Atmospheric Administration. The LAPD pulled out of the Los Angeles move to the cloud because of security concerns.

Cain said Microsoft's plan to begin offering a free version of Office 365 for Education this summer, and to aggressively cut the prices of other versions, is strong evidence that it's girding for battle with Google.

"Microsoft dropped fees simply because Google does not charge [education] customers," said Cain, noting that Microsoft was "increasingly losing share" in that crucial market.

> "The price cuts reflect **Microsoft's fear of Google.**"
> — MATTHEW CAIN, ANALYST, GARTNER

In a blog post, Michael Osterman, president of Osterman Research, contended that the price cuts are likely an attempt by Microsoft to spur sales of Office 365 among enterprise customers.

It isn't clear whether Microsoft's pricing strategy will succeed, because there's "substantial variation" in how demand increases after price cuts, Osterman said.

Osterman's research shows that when cloud-based email services are priced at $20 per seat per month, the market of "likely or definite adopters" is equal to 16% of midsize and large companies. At $15, the share of likely or definite adopters jumps to 27%, and at $10, it jumps to 49%.

"I suspect that Microsoft has done its own research and come to a similar conclusion — that the price cuts may be significant enough to create sufficient demand among its potential enterprise customers," Osterman wrote.

The decision to cut Office 365 prices came just a couple of weeks after Microsoft disclosed that it had started constructing a new $130 million data center in Dublin that will be used to run cloud services for its growing European customer base. A spokeswoman wouldn't say when the new facility will open.

Because the price cut came early in Office 365's life, it could convince wavering customers to stick with Microsoft, said Rebecca Wettemann, an analyst at Nucleus Research. She noted that it's "better for Microsoft to capture those customers at a lower price point than have Google or someone else compete for them." ◆

Perez *is a reporter for the IDG News Service.* **Mikael Ricknäs** *of the IDG News Service contributed to this story.*

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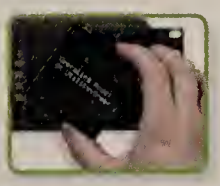

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THE Grill

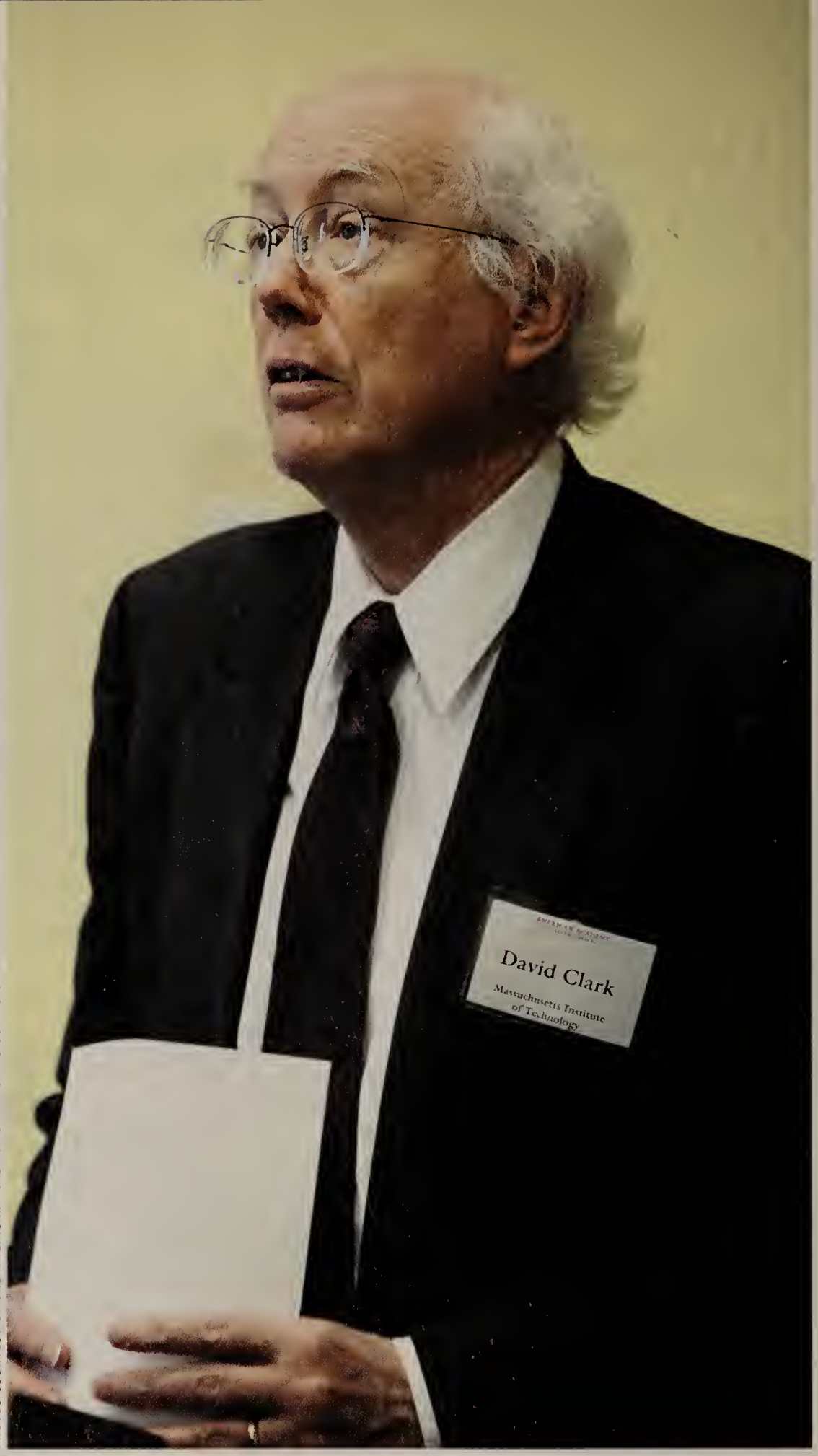
David D. Clark

This Internet pioneer wants to help users have better experiences online.

What do you do in your spare time? My wife would say that what I do in my spare time is work. I love my work. But I decompress: I read, I listen to music.

When you're not working, do you use the Internet? I have a presence in some of the social networking sites, but I confess I don't use them a lot. I go online and read things. The Web is a fascinating place.

Do you have times when you're completely unplugged? There have been two times in the past two years when I was completely off the Net. It was when my wife and I went to the Arctic, but I still had technology with me. I still had my computers, because I was taking digital photographs.



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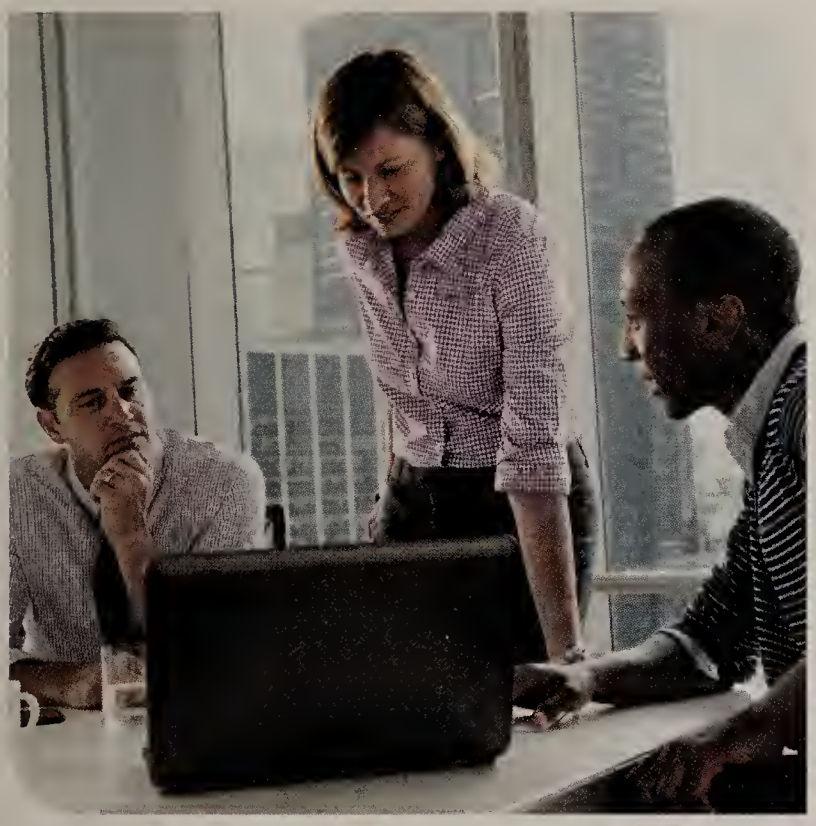
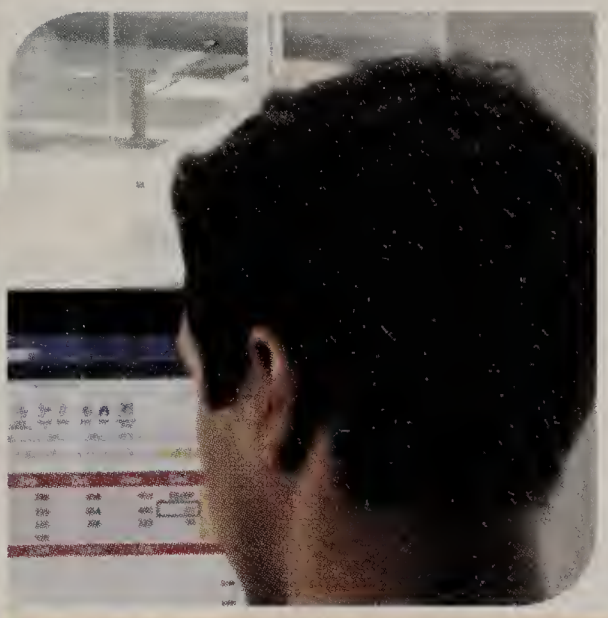
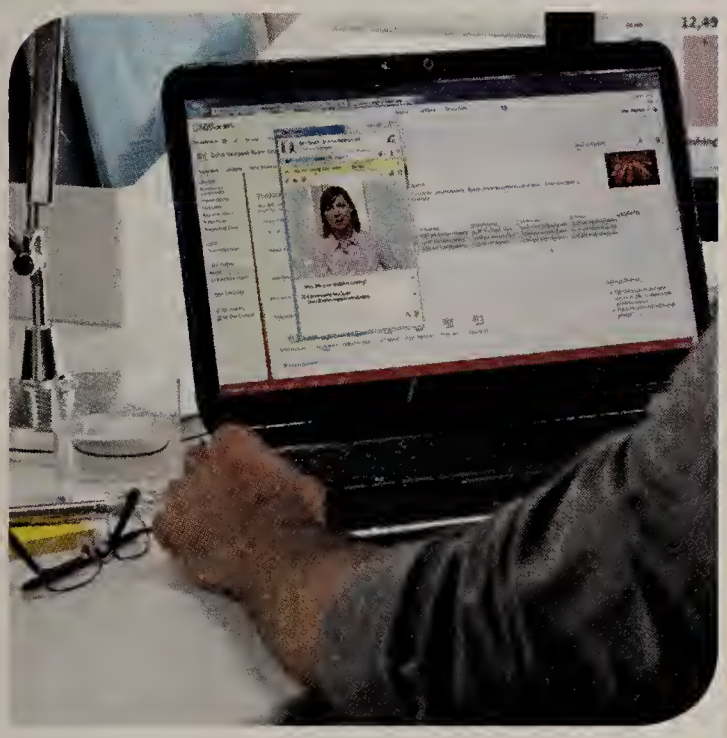
WHEN *the American Academy of Arts and Sciences decided to explore the complex issues of security and privacy in cyberspace for its academic journal* Daedalus, *it tapped Internet pioneer David D. Clark to serve as guest editor. Clark's credentials certainly made him a worthy selection. He has been involved in the development of the Internet since the 1970s and served as chief protocol architect and chair of the Internet Activities Board from 1981 to 1989. Today he's a senior research scientist at MIT's Computer Science and Artificial Intelligence Laboratory. His research focuses on redefining the Internet's architectural underpinnings. Clark, who in September received the Oxford Internet Institute Lifetime Achievement Award for his work, talks here about the Internet, its potential and problems, and its future.*

Continued on page 16

Microsoft







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Microsoft® Office 365

> **On the Internet,** it's really hard to tell if you've done the equivalent of ending up in a bad neighborhood.

Continued from page 14

What do you see as the biggest benefit of the Internet? Hooking people together, intermediated by computing; hooking people to information, intermediated by a computer. In the early days, we thought we were hooking people to computers. I remember in the days of Arpanet, when email emerged, the people doing the funding said we shouldn't be doing something like email; we should really be focused on hooking people to high-power computing. But to me, [the benefit] is this intermediation of people getting to information and to each other. The computer is just the platform that makes some of this happen.

What do you see as the most troubling aspects of the Internet today? The Internet is a fairly general platform, so all kinds of things can happen there, including good things and bad things. The issue we're dealing with today is, how do we police and control the bad things without impairing the good things? This is a problem that has a technical engineering component but also has a very social component. The sort of fears that everyday users have of something bad happening to them — combined with a sense that even if you're afraid of it, there's so much that's important happening on the Internet that you have to use it — is an issue. And for some people, fear is a reason why they refuse to use it. We have to help people have good experiences and not bad ones.

You wrote about making the Internet "a hospitable place." Do you think it's inhospitable now? My answer really relates to the previous question. On the Internet, it's really hard to tell if you've done the equivalent of ending up in a bad neighborhood. It's hard to tell if you should be nervous about the experience you're having. At the superficial level, it's very welcoming, it's "Come to my website," but there's always a little bit of uncertainty as to what's happening, and it's really that that makes me think about it being an inhospitable place. It should be a place where you feel comfortable. For most people, it's a place they go every day, but I'm not sure how many of them feel comfortable going there.

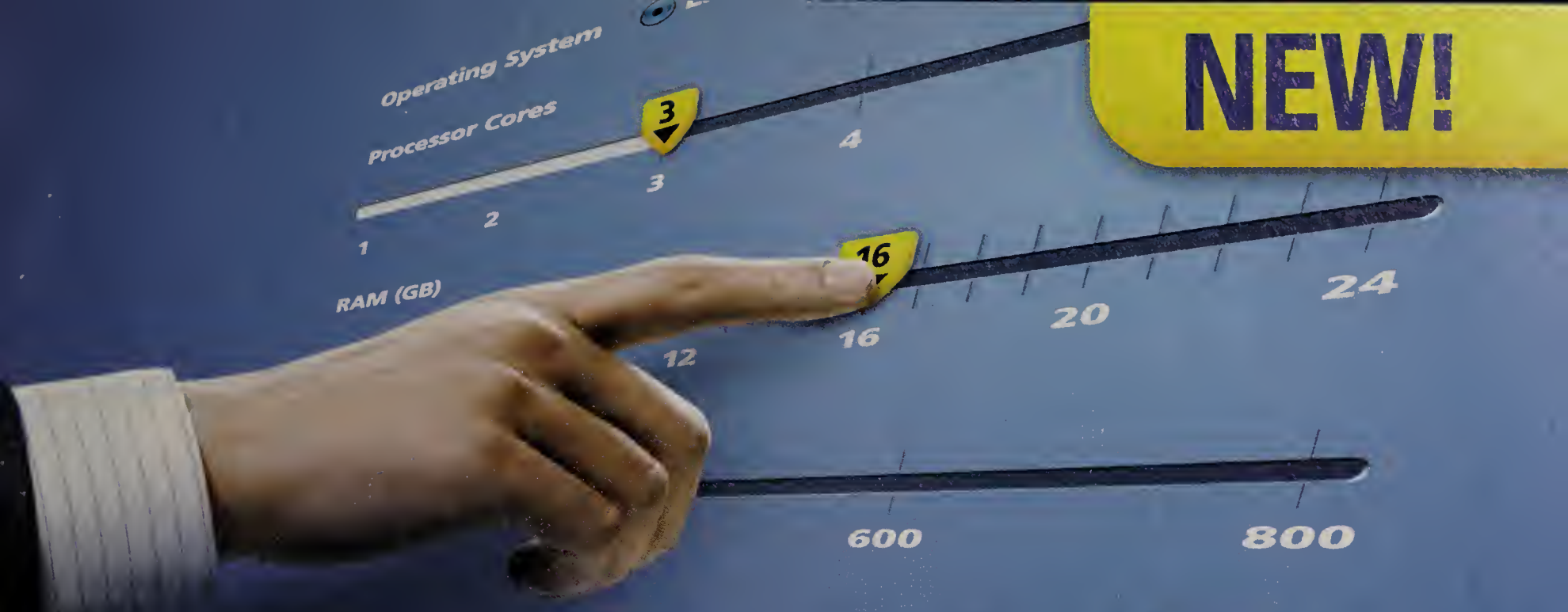
You wrote about the need for society to address barriers to using the Internet. Who should lead such efforts? The question is an interesting one, because it implies that we need chosen leadership to accomplish this task. That's to be studied, not a presumption. If you look at the essence of what makes the Internet what it is today, it's that nobody's in charge. I would re-ask this question as: "Do we need leadership in order to accomplish this?" I think nobody needs to be in charge, we just all need to understand these are pressing questions. All that said, this is an issue where the government should pay attention.

You also wrote about people stepping up to design and shape the future of the Internet. Is it possible to reshape the Internet at this point? Let me qualify my answer by being careful about what the Internet means. In the beginning of my [*Daedalus*] essay, I pointed out that to a technologist, the Internet is a very small part of the experience. It's that layer of technology that carries one packet from one area to another. When we talk about the user experience and how it's shaped by the application, the Internet changes very fast. Look at the speed at which Facebook and Twitter and Google+ are emerging. Some of the underlying technology we've been trying to change for 10 years, but that doesn't change the user experience.

Who should step up to do this? Let me answer that with a pair of quotes. A famous computer scientist named Alan Kay said, "The best way to predict the future is to invent it." My variation on that quote is, "The best way to predict the future is to invest in it." If you look at the early history of the Internet, the investment was made by the government. Today most of the investment comes from the private sector. So what you see today is that most of the incentives to step up and innovate in this space have been motivated by commercial interests, and that's fine, but who else might have a motive to change the Internet?

How do you ensure that those who step up to shape the future of the Internet have beneficial intentions? The question has a presumption of what is beneficial. What's going on today is just a bunch of experiments. Facebook was an experiment, and it worked. Twitter was an experiment, and it worked. On the Internet, there are issues of fraud and privacy and there will be government interventions, but by and large, I like to say the benefit in most cases is determined by experimentation [and asking]: Did we meet a need?

– *Interview by* Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*



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PAUL GLEN

Words Are First Hurdle For New Tech Managers

New managers lack the language to understand the value of management itself.

Paul Glen is the CEO of Leading Geeks, an education and consulting firm devoted to unlocking the value of technical people. You can contact him at info@leadinggeeks.com.

NEW MANAGERS STRUGGLE. They also don't get much help — or sympathy. My last column elicited a lot of heartfelt reader emails about the difficulty of, and lack of support for, the transition from technical work to management. My conversations with those readers also revealed that whatever support they did get left their biggest need unmet. Training focused on skills — the mechanics of management — but the new managers still lacked the language to truly understand the value of management itself.

That's right. What they needed most were words.

They can think and speak clearly about technical work and how it adds value. But when it comes to the value of management, they have only vague words and platitudes to guide them. Without the clarity of language, new managers:

- Can't know what's important in their jobs.
- Can't focus on value-adding activities.
- Feel incompetent.
- Feel worthless for not adding value.
- Are afraid to ask for help.
- Don't even know how to ask for help, since they don't know what they don't know.

It's no wonder that so many new managers cling to their technical work like a drowning man to a life preserver. At least it lets them know when they are adding value and being competent.

As I've coached managers, I've noticed that they need to progress through three distinct phases.

Phase 1: The language of engineers. New technical managers come to the job assuming that a manager is just an engineer with power. They believe that managers don't add value; they just supervise those who do. They retain the assumption that value exclusively comes from building and fixing things. So, they talk about writing, developing, designing, building, coding, testing, deploying, fixing, diagnosing and producing.

Phase 2: The language of authority. As they begin to differentiate their former role from the new one, they focus on authority — on status rather than value. This is a dangerous time. Managers who linger (or get stuck) in this phase get branded as self-centered and power-hungry. In it, they talk primarily about leading, directing, deciding, planning, approving, monitoring, rewarding and punishing. As soon as you recognize this phase, start talking about the next one.

Phase 3: The language of managerial value. Successful managers recognize that authority itself does not add value, but is a tool that offers the opportunity. The value managers add comes from:

- Unleashing the productivity of others.
- Selecting activities with good paybacks.
- Avoiding costly mistakes.

When talking about unleashing others, managers focus on facilitating, coaching, selecting, mentoring, inspiring, organizing and protecting. They emphasize how they help others rather than how they command them.

Selecting valuable activities involves applying judgment, building consensus and marshaling resources. Managers think about analyzing, investigating, influencing, interviewing, presenting, measuring, negotiating, coordinating, delegating, setting goals, prioritizing and allocating resources.

Avoiding costly mistakes is about recognizing, asking, intervening, redirecting, preventing, finessing, resolving and firefighting.

To help a new manager grow into her job, give her the tools she needs. And the first ones are not resources and direction. The first are words to make sense of her new world. ◆

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DISASTER RECOVERY ON Double Duty

Here's how virtualization and replication technologies *protect data from disaster, while keeping business services humming.* **BY ROBERT L. SCHEIER**

AT INGRAM MICRO, executive president and CIO Mario Leone doesn't think about how much he will spend on disaster recovery.

That's because the global electronics distributor weaves its disaster recovery requirements into its broader business objectives and its service-level agreements (SLA) with its 15,000 users. Since 2010, the IT shop has been cutting costs and meeting its service and disaster recovery commitments by using

MICHAEL MORGENSTERN

a "hybrid" cloud made up of its own virtualized hardware at colocation facilities in Chicago, Frankfurt and Singapore.

And rather than paying for dedicated recovery hardware that sits around waiting for a disaster, it uses virtualization to shift workloads from a failed server to one running a less critical workload. "We're always using that architecture for something," says Leone.

More and more IT shops are using technologies such as virtualization and replication to make disaster recovery just another service, sometimes using the same servers, network and storage that run order entry, email, application development or other services. This merges what historically were disaster recovery and business continuity efforts, protecting the business against not only rare disasters, but also human error or equipment failures.

> **We can recover at our remote site** *much, much faster by just being able to fire up the system images of the VMs.*
>
> **JUSTIN BELL,** SYSTEMS ADMINISTRATOR, STRAND ASSOCIATES

Some store only data (and perhaps templates for virtual machines) off-site, creating (and paying for) the physical hardware to run them only when needed. "We can recover at our remote site much, much faster by just being able to fire up the system images of the VMs," says Justin Bell, systems administrator at Strand Associates, an engineering firm in Madison, Wis. Even if the server infrastructure at that site is less robust than the one at the primary site, "we could run in limited capacity, on much less hardware, until we got things back up at our primary site."

Other organizations have done away with dedicated disaster recovery systems. They shift production work to test or development servers during outages and defer work that's less critical.

More Demands, More Risk

These changes are driven by ongoing pressure to cut costs while maintaining continual uptime, and by the flexibility provided by server, storage and network virtualization. Meanwhile, a recent spate of natural disasters, along with stricter regulatory requirements, has made disaster recovery the No. 1 subject of client inquiries at research firm Gartner, says analyst John Morency.

However, Forrester Research reports that enterprise disaster recovery/business continuity budgets are stuck at 6% of total IT capital and operating budgets and that concerns such as "consolidation, business intelligence and virtualization" are given higher priority when it comes to spending.

Meanwhile, the list of critical services that need protection keeps growing, with communication tools such as voice over IP and email gaining "critical" status alongside traditional business applications like order entry and ERP. Finally, it's necessary to ensure uptime not only after major disasters, but also in the event of localized failures, and many companies need the ability to quickly recover just one file rather than an entire system.

By separating virtual servers, networks and storage capacity from physical hardware, virtualization gives users many more choices in disaster recovery strategies. "When you recover a [virtual machine], it doesn't matter where we put it," says Kurtis Berger, IT manager at Provider Advantage NW, a healthcare software and services company in Beaverton, Ore. "At each of our data centers, all of our VM servers are pretty much the same. [Almost] any old box . . . will handle the prescribed load, and it'll be good enough to recover some VMs onto."

Disaster recovery is also being transformed by fast, easy-to-use replication software that copies data between primary and recovery sites in near real time. One such offering, Double-Take software from Vision Solutions, allows users to sync data among servers and establish failover protection in about 20 minutes, says Joseph Pedano, senior vice president for data engineering at Evolve IP, a provider of cloud-based IT services in Wayne, Pa.

Martin Mazor, Ingram Micro's director of global information assurance, wouldn't discuss which products he uses, but he says replication allows his company to recover systems much more quickly than the full day it would take to ship tape offsite. Ingram Micro has also invested in tools that provide a single performance dashboard for all of its worldwide operations, and it has offered employees training in areas such as operational management and the handling of incidents and problems.

Evolve IP uses VMware virtualization technology, and Pedano says backup and recovery tools now feature improved VMware integration, making it easier to replicate and restore not just servers, but also their associated databases and security systems.

To successfully restore a business service such as email or order entry, IT must recover the application server as well as associated components (such as an Active Directory server that contains user information or a database that holds inventory records), and it must do so in the proper order. Taking these dependencies into account is a major area of focus for vendors.

Continued on page 24

Recovery In the Cloud

- **Start with applications that already perform well in virtual or private cloud environments** but don't support your most critical systems. This gives you time to try different approaches and vendors.
- **Be realistic about SLAs,** and know that most cloud providers won't take responsibility for your losses if you can't recover after a failure.
- **Understand the interdependencies among the applications and services you host in the cloud** and those you host in a traditional data center so you properly test recovery.

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Continued from page 22

Symantec, for example, recently announced that enhancements to its backup products combine more granular backup and recovery of VMs with the ability to account for dependencies among VMs. The enhancements, found in products for businesses of all sizes, also make it easier to use multiple public or private cloud backup services, and to convert a physical server at a production site to a virtual server at a recovery site, says Dan Lamorena, director of product marketing for Symantec's storage and availability management group.

Continuity Software's RecoverGuard software is designed to automatically check all critical infrastructure components, such as the file system and virtualization components, and identify vulnerabilities that could cause downtime and data loss. It looks for vulnerabilities using a database of "signatures" similar to the ones antivirus tools use to identify malware. The database is updated by the vendor's researchers and its users, says CEO Gil Hecht.

Other products with those capabilities include VMware vCenter Site Recovery Manager, which also supports custom scripting and automation to ensure that VMs are brought up and reconnected in the proper order across multiple sites, says Gaetan Castelein, VMware's director of product marketing.

Making It Pay

Often, the only way to get funding for disaster recovery systems is to demonstrate that they deliver more than just "insurance," or that they can even pay for themselves. For example, Strand uses FalconStor Software's Continuous Data Protector appliance to replicate about 50TB of data and 25 virtual servers between its remote offices and headquarters. This is not only easier and less expensive than using a colocation facility, but the higher bandwidth required for the replication also makes it easier for employees to videoconference and share complex engineering documents.

That bandwidth also allows Strand to "take snapshots every hour on the hour, so we can facilitate a file restore in about three to five minutes," says Bell. Given the expense the company would incur if an engineer had to repeat several hours of work, the ability to take snapshots helps justify the cost of disaster recovery even without a disaster, he says.

Schmidt: Thorntons has full disaster recovery now.

Thorntons Inc., a Louisville, Ky.-based convenience store operator, recoups much, if not all, of the cost of disaster recovery by using DataCore Software's SANsymphony storage virtualization software on XIOtech SANs it purchased to support its newest servers, while moving its older Dell Compellent SANs and older servers to nearby space it already leased as a disaster recovery site. Senior network engineer Kevin Schmidt says that gives the company disaster recovery for its full application environment, not just its data, and it has improved performance and cut the time required to produce a profit and loss statement from 10 or 12 hours to less than five hours.

Another benefit is that virtualization allows the company to use the Dell Compellent storage, for which it paid $350,000 in 2007, as a recovery platform for its newer XIOtech storage.

Continued on page 26

Snapshots in Time

IMPROVING THE PERFORMANCE of replication systems and related technologies, such as snapshot tools, and tailoring them to shorten virtualized disaster recovery times is a key focus for vendors. Here are some examples.

- **Actifio's Protection and Availability Storage** (PAS) appliance allows users to execute a one-time transfer of data to a remote site, and then send only changes to the data, with the changes themselves deduplicated, says Actifio CEO Ash Ashutosh. This not only reduces bandwidth requirements; it can eliminate the need for backup software, he says.

  The distributed object file system within PAS contains information about each block of stored data that makes it easier to find and reuse the data for purposes other than disaster recovery, such as test and development, regulatory compliance or legal searches, he says.

- **FalconStor's CDP** aims to speed recovery by ensuring the most recent snapshot is always the most complete. This eliminates the need to factor in the incremental changes since the initial backup before recovering the data. And it can save hours when recovering tens of terabytes of data, says Fadi Albatal, vice president of marketing and product management.

- **Asigra's Cloud Backup** eliminates the need for dedicated physical recovery hardware by automatically backing up VMs to virtualized environments and scaling up the VMs in the recovery environment so they can meet production needs. By automatically creating new servers and provisioning storage, it can reduce restore times from hours to minutes, says Eran Farajun, an executive vice president at Asigra.

- **Egenera's PAN (Processing Area Network) Manager** software virtualizes connections between physical or virtual hosts to a customer's network or storage resources, thereby speeding restoration by making it easier to create not just VMs, but also the network and storage connections needed to make them work, says John Humphreys, vice president of marketing.

  PAN can also automatically detect failures in production servers and move them to the recovery environment, with the new server looking "just like it did before, with the same MAC address and same resources," says Scott Geng, senior vice president of engineering.

- **Dell's Compellent Live Volume** enables a physical server or VMs to share a virtual storage volume among Dell's Compellent Storage Center SANs in a semi-synchronous configuration that enables always-available failover volumes or LUNs, and makes it possible to move data closer to users for performance reasons, says Brett Roscoe, general manager and executive director of data management at Dell.

  Jason Buffington, an analyst at Enterprise Strategy Group, says applications like Microsoft Exchange, Microsoft SQL Server and some network-attached storage platforms offer capabilities such as replication and failover at little or no extra cost.

– ROBERT L. SCHEIER

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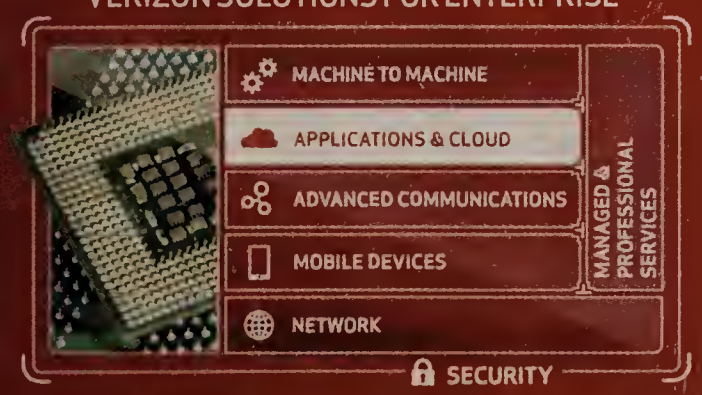

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Continued from page 24

Cloud Disaster Recovery? Not So Fast

Some providers say cloud-based disaster recovery will bring the benefit of true disaster recovery, rather than just backup, to small and midsize businesses that until now couldn't afford it.

Pat O'Day, co-founder and CTO of Bluelock, a provider of public cloud virtual data centers, says customers are increasingly satisfied with cloud security. Many security experts say even public cloud environments in which multiple customers share hardware can be made secure with the proper processes.

But a fall 2011 Forrester Research survey showed that only 11% of large enterprises and 9% of small to midsize businesses had adopted recovery as a service, with 35% of large enterprises and 41% of SMBs saying they were interested in it but had no plans.

Berger says cloud providers only promise "not to go into your servers" when he questions them about security. "To me, that's not enough," he says, adding that the disaster recovery prices he's hearing — $500 per month per server — are "more than I can justify." He instead uses Acronis Backup & Recovery to back up approximately 60 VMs at two data centers. The facilities are only a half-hour apart, so this setup would not meet some definitions of a disaster recovery system, but he says it covers most of his needs because the applications aren't mission-critical.

Berger: Disaster recovery in the cloud is too costly.

Hecht downplays resistance to cloud-based disaster recovery, saying the smallest companies typically host their entire infrastructures in the cloud, and thus get some level of disaster recovery simply by keeping applications and data off-site.

Smaller companies that do choose the cloud typically don't do it for the savings, he says, but because "it's just so much simpler to have a system you set up and forget."

While midsize organizations have some incentive to consider disaster recovery in the cloud, few of them use the cloud for mission-critical systems that require true disaster recovery — and what they get in the cloud is closer to dedicated hosting (with the customer's data and systems running on separate hardware) rather than a multitenant, elastic, pay-as-you-go public cloud, Hecht says.

Most large organizations are big enough to provide disaster recovery themselves, he says, and even if they weren't, "there's no good solution" for protecting sensitive applications in the cloud.

Cloud disaster recovery is also not suited for applications that rely on older platforms that most cloud providers don't offer, or large databases that don't perform well in the cloud, says Morency. Users also need to watch for the hidden costs of software licenses some cloud vendors charge for software sitting unused on remote VMs or disaster recovery systems, he says.

Both Gartner and Forrester also warn that most cloud disaster recovery providers will refund only a portion of a customer's fee if disaster recovery falls short — nowhere near enough to make up for the potential revenue loss that such an event could cause.

The cost of the bandwidth required to quickly recover an organization's VMs and data from the cloud is often an unwelcome surprise, says Alan Arnold, executive vice president and CTO at Vision Solution Management, which provides high-availability and disaster recovery software and services. Some customers and providers opt to physically ship portable hard drives via overnight courier, says Arnold, recalling that one user joked that "FedEx is still the largest-bandwidth network out there."

With IT so central to the business and budgets so tight, it's essential to get input from top business managers to assess which applications deserve the highest levels of protection. Ingram Micro, for example, conducted a business impact analysis that put various applications in different tiers, with voice, email, ERP and ordering among the top priorities. The company thought of it "just like an insurance policy," says Mazor. "It helped us think of how much insurance we're going to buy." ◆

Scheier *is a veteran technology writer. You can contact him at bob@scheierassociates.com.*

New Approaches To Data Recovery

SOME IT SHOPS are expanding disaster recovery to include not only servers, but also user devices. They're using portions of backup sites to store images of virtual desktops, laptops or even tablets so users can have access to their data and applications while they await replacement devices, says Eran Farajun, executive vice president at Asigra, which is also giving customers the ability to back up and restore data from consumer devices such as smartphones and tablets.

Jason Buffington, an analyst at Enterprise Strategy Group, says many companies now require branch offices to adopt the same protection standards as headquarters. He says products designed to help with such efforts include Riverbed Technology's Steelhead EX+ Granite appliances, which optimize the performance of wide area networks to speed backup and replication from branch offices to central data centers.

And many organizations are reducing or ending their use of tape for disaster recovery, although some still use it for long-term archiving.

"For us, tape is dead," says Kurtis Berger, IT manager at Provider Advantage NW. "It was the second tape drive that failed that finally pushed us toward a hard-drive-only solution. Hard drives are faster, and so cheap. We just couldn't find any reason to entertain the idea of tape anymore."

"Tape has been a love-hate relationship — mostly hate," says Jason Axne, systems administrator at conveyer belt manufacturer Wire Belt Company of America. He cites tape's unreliability, the lengthy recovery periods for even single files or email inboxes, and the time required to manage backups. Using Actifio PAS and disk-based storage, he says, "I don't spend any time during the day managing our backups . . . because it just works."

— ROBERT L. SCHEIER

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WHO HOLDS THE Keys?

Encryption isn't bulletproof if keys and digital rights are left out in the open. *Here's how to lock down stored data.* BY STACY COLLETT

ENCRYPTION can make up for a litany of security snafus — from a bad firewall to an unrelenting hacker to a lost laptop. Once data is encrypted, criminals can't use or sell it. Plus, if encrypted data goes missing, companies are protected from disclosure requirements in most states. No wonder 38% of companies surveyed by Forrester Research have already adopted full-disk encryption technology. But data protection doesn't stop there. Encryption keys and digital rights also must be well orchestrated and secured, or else encryption protection goes out the window.

Continued on page 30

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I also want to improve the user experience. *If I can do that, as well as potentially lower my cost of control, self-encrypting drives might be the answer.*

MALCOLM HARKINS, CISO, INTEL

Continued from page 28

For instance, encryption keys kept in a predictable place are like house keys left under a welcome mat: They're easy prey for intruders.

In December, hacking group Anonymous broke into SpecialForces.com, a provider of law enforcement equipment, and stole thousands of customers' data and credit card numbers. The data was encrypted, so the crisis appeared to have been averted. But the hackers didn't stop there. They broke into the company's servers and stole the encryption keys. The group then leaked roughly 14,000 passwords and 8,000 credit card numbers of customers on its website.

"Most of the standardized encryption methods or algorithms specified by [the National Institute of Standards and Technology] are good, it's just how you implement them and how you do key management," says John Kindervag, an analyst at Forrester Research.

While many companies have deployed full-disk encryption to comply with regulatory mandates or to avoid public disclosure requirements under state privacy laws if data is lost or stolen, an alarming number of companies still don't take precautions.

More than half of 500 IT professionals surveyed by Ponemon Institute and Experian Information Solutions in January said their lost or stolen data wasn't encrypted. Lost data most often included email (cited by 70% of the respondents), credit card or bank payment information (45%), and Social Security numbers (33%). If the organization was able to determine the cause of the breach, most often it was a negligent insider (34%). Some 19% said outsourcing data to a third party was to blame, and 16% said a malicious insider was the main cause.

"Any device that leaves your organization needs to be protected, and with more than just a password," says Gartner analyst Eric Ouellet. "We know you can jailbreak these things very easily." Data at rest must be protected, too, he adds. "Even mislabeling a tape [in storage] or not being able to find it is a disclosure event," unless the data is encrypted.

Semiconductor production equipment maker Applied Materials faces strict customer and legal requirements to protect information. The company, which operates in 25 countries, began rolling out full-disk and message encryption in late 2010 as part of a tech refresh of its 13,000 laptops. Today, 78% of laptops are encrypted, with only a few holdouts.

"The change has been positive all over the world," says Matthew Archibald, who serves as both chief information security officer and chief privacy officer at the Santa Clara, Calif.-based company. "On the engineering side, they believe anything slows [the system] down, so you have to show them that it doesn't impact them in any way."

At Intel, 85% of laptops have full-disk encryption, but CISO Malcolm Harkins is already assessing the next big thing — self-encrypting hard drives, which will address encryption gaps when laptops are in standby, sleep or hibernate modes.

"As you're moving to products that are always on/instant on, if you've got a nine-hour battery life and it's always on standby, the data is not encrypted," Harkins says. "I also want to improve the user experience," he adds, referring to the fact that encryption typically requires users to enter passcodes and wait for systems to reboot. "If I can do that, as well as potentially lower my cost of control, self-encrypting drives might be the answer."

Key Management

While encrypting data is important, the keys that control the encryption and decryption processes are even more important because, well, data is useless without a key. And with so many programs and devices requiring encryption and individual key management, it's easy to see why keys can be mismanaged or why dangerous shortcuts are taken to manage them.

Today, most encryption systems have their own built-in key managers that also create backups, "so at least you have some consistency," Ouellet says. "The key manager that comes with those solutions is probably good enough." But centralized key management might be the answer for companies that find themselves using a growing number of encryption tools and keys.

A quarter of companies surveyed by Forrester have adopted centralized key management in some form, he adds, but that number will grow as interoperability standards take hold.

Open standards organization Oasis has developed a key management interoperability protocol (KMIP) as a standard within cryptographic systems. "This standard has been growing and is replacing older standards," Ouellet explains. "The only catch is that while most organizations that provide cryptography want to support KMIP, they'll do it as a means to manage others' keys. They're not allowing others to manage their keys. It's kind of a chicken and egg thing," which will hold back adoption "unless the vendors start opening themselves up," he says.

Do's and Don'ts

Analysts say to leave key management to the professionals. Kindervag advises IT shops to deploy an enterprise-quality key management program that understands key management in their companies. "Don't try to build your own," he cautions. "Don't email keys back and forth, and don't leverage things like Active Directory to store keys."

Do keep the key management function in a segment of your network that is completely separate from the encrypted data, and protect it with features such as Layer 7 firewalls, IPS devices and strong access control, he adds. Only a few people who are designated to manage keys should have access to that segment of the network, and they should constantly monitor what is happening on the key management servers, such as who is seeking access.

In the near future, key management will be available in the cloud with service providers who specialize in enterprise key management. "Traditional PKI vendors are moving in that direction," Kindervag says, and credit card payment processors are capable of expanding their key management technologies into intellectual property and custodial data areas.

Cloud key management is also "a big trend right now" for smaller organizations that don't feel comfortable owning and managing keys, Ouellet says. Cloud providers can create private virtualized environments for small businesses and manage the technology side.

The trick to successful deployments of encryption, key management and digital rights is to make things easy for users.

"Spend quality time with self-installing packages," says Applied Materials' Archibald. "We have automated distribution of the software, and it's just a matter of having it enabled for the user. There are only two or three things an individual needs to do — set their pass phrase, sync that to their Windows login and reboot their machine." ◆

Collett *is a* Computerworld *contributing writer. You can contact her at stcollett@aol.com.*

$184 MILLION TO $330 MILLION:

The average loss in a brand's value after a data breach.

SOURCE: EXPERIAN INFORMATION SOLUTIONS

Proceed With Caution

WHILE ASSIGNING RIGHTS for viewing and editing documents seems like a good idea, it's not something that Gartner's Eric Ouellet recommends for organizations that need to keep documents for a long time.

"There are no standards for EDRM [Enterprise Digital Rights Management]," he explains. If a vendor changes the cryptography or the way it applies the technology, users must upgrade or retrofit all existing documents or run the risk of having orphaned documents that no one can open. One Gartner client had to upgrade twice over the past eight years, he adds.

"If documents are only going to live for 12 to 18 months, that's a risk window that you can manage," he says. "But if the documents need to live for four to five years or more, then you have to start building alternate systems," such as ones for keeping copies in plain text that are accessible to only one or two people in the organization.

– STACY COLLETT

Big Fish, LITTLE POND

It's a small organization with an even smaller IT shop, and it's all yours. Tech execs share the pros and cons of leading modest operations.

BY BETH STACKPOLE

AS A CIO with an IT staff of four, Steven Porter understands full well what it takes to do more with less.

His team at Touchstone Behavioral Health is tasked with stretching a shoestring IT budget to

Continued on page 34

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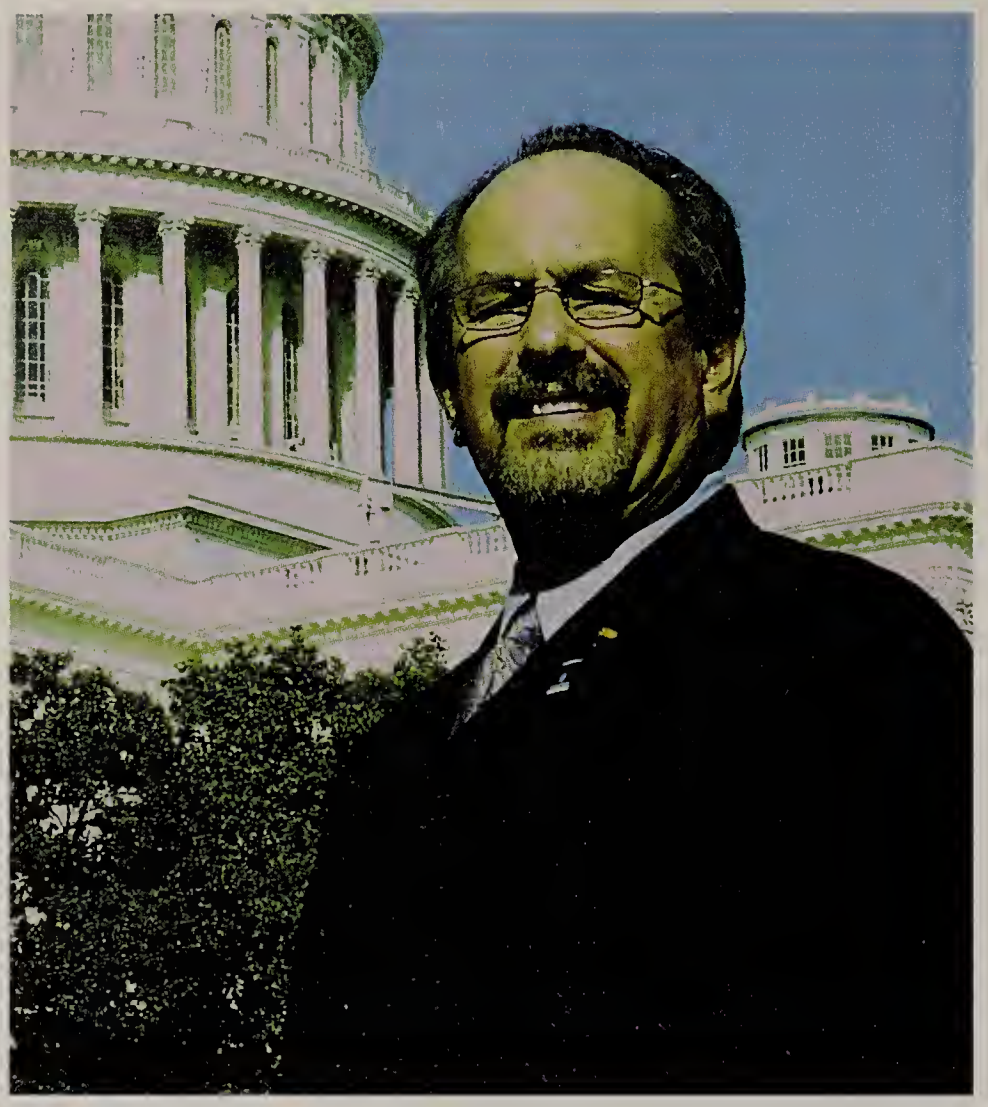

I'm IT director, chief technology officer, truck driver, window washer and, at the end of the day, hands-on technologist.

STEVEN PORTER, CIO, TOUCHSTONE BEHAVIORAL HEALTH

Continued from page 32

cover big-enterprise-style initiatives like virtualization and VLANs, while at the same time providing hands-on support to more than 200 users scattered across the state of Arizona.

"Some days I wonder what the hell I'm doing here," jokes Porter, 60, who has worked at Touchstone, a provider of behavioral services to at-risk children in the state's Medicare program, for more than five years.

Following a successful run as a television producer of live auto racing events and motorsports news programming, Porter leveraged his burgeoning interest in the Internet to land a job with an e-commerce developer in 1995. After he served a couple of subsequent dot-com stints, Touchstone Behavioral sought him out for the IT director's spot.

Porter sees the role as a challenge. "I'm being asked to do the same things as my enterprise counterparts . . . but the head count of our entire IT organization is smaller than one of their development teams," he says.

Even with budget shortfalls and resource constraints, Porter says he wouldn't have it any other way. "I'm IT director, chief technology officer, truck driver, window washer and, at the end of the day, hands-on technologist," he says. "I have the opportunity to make a difference and the flexibility to be hands-on when I want to be. That's a pro for me."

It's an upside for plenty of IT professionals who, like Porter, see value in being a big technology fish in a small pond. They view the requirement of rolling up their sleeves and getting their hands dirty with technology as a bonus, not a burden. For them, a tight budget represents a challenge to be creative with project choices. And here's their take on a small shop's flatter organizational structure: It doesn't mean fewer career choices; it's an opportunity to exert more control over initiatives that can have a meaningful impact on the business.

On the other hand, working within the constraints of a small IT shop isn't always a bed of roses. Beyond budget and resource restrictions, some smaller organizations aren't culturally ready to take on state-of-the-art technology. And experts and small-shop CIOs say that IT can be pulled in conflicting directions, with politics and personality trumping business value as the gauge for getting buy-in on certain tech initiatives.

Wise Career Choice? Maybe

Those downsides don't deter Porter, who says his propensity to buck bureaucracy and his desire to make a difference make him a good fit for a smaller organization. That was certainly what prompted him to take the IT director spot at Touchstone Behavioral — and stick around long enough to grow it into a full CIO role.

"The company's mission appealed to the old hippie in me," Porter says. "With technology, we deliver tools that help with some of the business processes and documentation. If that gives [therapists] another 15 minutes a day to work with the kids, then we've achieved something."

With less bureaucracy and smaller leadership teams, Porter says, his group is more nimble, implementing sophisticated initiatives around mobility, security, virtualization and voice over IP in months rather than in the years it takes larger organizations to close the books on similar projects.

"Governance becomes a matter of two or three business units getting together, sometimes literally in the hallway or over a cup of coffee, and making the decision to go in a certain direction or to have this particular project's needs supersede anything else going on," he says.

Porter and other tech execs at small organizations might find such agility appealing and the challenges enjoyable, but is a stint in a small organization good for an IT professional's career trajectory?

Some industry watchers say small-ponders are in a position to cultivate skills that set them apart from their peers. "When you're a leader in a small department, you gain experience you'll never get in a large organization," says John Reed, executive director of Robert Half Technology, an IT staffing firm.

Continued on page 36

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"Because they have an all-hands-on-deck mentality and there are often no defined career descriptions, [small-company tech execs] learn a lot of additional skills and how to do more with less. It lets them build out their résumé in a robust way and makes them more marketable to their next employer," Reed asserts.

IT staffers in larger organizations might only be able to gain cursory management experience by a given point in their careers, for example, or might only focus on one specific technology area, like virtualization.

In comparison, tech professionals working their way up the ladder in a smaller firm with fewer specialists often do hands-on problem-solving across numerous technologies. They also have the potential for deeper management experience — working with budgets and interfacing with other business functions, for example.

The downside is that lingering too long on the small-shop path puts a tech exec at risk of being pigeonholed as someone who "won't translate well to a large organization," Reed cautions. "If you start exceeding the five-year mark, you need to stop and think from a career perspective, 'Am I happy staying in this type of setting from now on?' "

If you start exceeding the five-year mark, you need to think from a career perspective, 'Am I happy staying in this type of setting from now on?'

JOHN REED, EXECUTIVE DIRECTOR, ROBERT HALF TECHNOLOGY

With management experience in both small and large municipal IT departments, Paul Haugan believes the difference between the two relates primarily to the amount of red tape attached to a given tech project.

During a previous role at the city of Fresno, Calif., where Haugan, 54, helped oversee an IT group of 75, it took about 15 months to push both a business intelligence project and a time and attendance system through the proper channels to get funding. In his current role as CTO of the city of Lynnwood, Wash., the same projects took around three months, all told.

"In a big operation like Fresno, by the time [you] go through the bureaucratic administrative steps just to get a project done, the technology is obsolete," says Haugan, who is now responsible for about 10 people supporting close to 500 end users and who oversees an IT budget of between $2 million and $2.9 million. "I'm a firm believer in technology's opportunity to enact significant change. I'm one of those guys who can't wait for the bureaucratic wheels to turn, because there is too much value being lost."

Haugan cites projects involving aging phone systems as further examples of his ability to enact technology change much faster in Lynnwood than he could in the larger Fresno IT infrastructure.

When Haugan first came to Lynnwood five years ago, the city's 25-year old PBX phone system was failing on a daily basis. In a matter of months, he made a successful case to implement VoIP, including a network overhaul that encompassed the integration of voice and email.

Back in Fresno, a similarly aging phone system never ended up being replaced, just perennially fixed, because management considered it too disruptive to replace a system that served 60 sites and more than 5,000 employees, he recalls.

"[In Lynnwood], I didn't have all these hurdles to jump," Haugan explains. "I didn't have to go to each director and say, 'I want to put VoIP in and here's why.' I could go straight to the mayor and make it happen. There was much less red tape, and I was in a position to make the decision and work within the municipal code in the most effective way possible."

While Haugan is generally happy with the flexibility of leading a smaller IT organization, he admits to concern over the inevitable salary hit. (*Computerworld*'s 2011 Salary Survey shows that CIOs and VPs of IT at companies with fewer than 100 employees earn about 44% less than the average compensation for those positions across organizations of all sizes.)

Beyond that, he's worried that he may not be fully developing the sophisticated political awareness that's required to make things happen in a larger organization.

Still, Haugan believes the skills he has honed could directly translate to a larger organization. "Everything I have learned at a big city, I have used in the small one. Everything I learned in the nonprofit world, I have used at both the big and smaller cities," he points out.

"My greatest strengths are in relationship-building and innovation. These are skills that translate across the board," Haugan says.

Making a Difference, Fulfilling a Mission

As CIO of the nonprofit Make-A-Wish Foundation of America, Jim Toy, 43, finds fulfillment not just in helping his organization carry out its mission (to grant the wishes of children with life-threatening medical conditions), but also in orchestrating leading-edge technology deployments with an eye toward maximiz-

ing limited budgetary resources.

On Toy's watch, the foundation has implemented a professional-grade data center with advanced technologies like blade servers, storage area networks, virtualization and disaster recovery — working within an annual budget of well under $1 million, which includes salaries for himself and his 11 staffers, who are charged with supporting 1,500 users nationwide.

Toy, who has worked at Make-A-Wish for 16 years, was introduced to the organization while helping a fellow IT contract worker do a network upgrade there. With that project successfully off the ground, Toy was tapped as the organization's first IT manager and was promoted to IT director in 1999 and CIO in 2008.

During his tenure, Toy has developed a talent for soliciting hardware and software donations from vendors. That's a unique assignment that only a CIO at a nonprofit would be expected to undertake, but the donations help him deal with budgetary bottlenecks.

"In a large organization, you have to work within these guardrails where this is the technology and this is the budget," he says. "Because you can't go over budget, you propose new things and they get shot down. I'm not limited by that. I can go out and acquire new technology and get deep discounts because I'm a nonprofit."

Toy admits that he may have less opportunity to grow technologically than a CIO at a large company, but he feels that this limitation is offset by his ability to take on additional responsibilities in the areas of finance and operations. The lower pay of smaller firms and nonprofits in general might be a deterrent for some, Toy says, but it's a sacrifice he's willing to make.

"You just need to find tradeoffs to the lower salary of working for a nonprofit," he says. "With Make-A-Wish, it's the mission of the organization that's so rewarding."

My greatest strengths are in relationship-building and innovation. These are skills that translate across the board.

PAUL HAUGAN, CTO, CITY OF LYNNWOOD, WASH.

Daring to Go Where Large Firms Won't

The same goes for Edward Ricks, CIO and vice president of information services at Beaufort Memorial Hospital, where he leads an IT staff of 23.

Sure, the financial resources might be less than what's available at larger organizations, and his IT group is often pulled in a lot of different directions, depending on personalities and who can grab his ear. But even with these tradeoffs, Ricks, 49, doesn't see himself at a larger organization. From what he's heard from colleagues, he'd be out of his comfort zone. "In those situations, so many other folks have control over what's going on with you, you can feel like a widget, not an individual," he says.

Ricks doesn't think he's missing out on an opportunity to do big things with technology at a larger organization. In fact, his community hospital has adopted a number of cutting-edge healthcare technologies, including single sign-on systems, an RFID employee identification tool, and a provider order-entry system that physicians use to enter orders directly.

"Ironically, one of the larger hospital systems just came down here to visit and see what we've done," Ricks says. "They're interested in doing it, but they just haven't been able to get to that point."

Ricks is equally unconcerned that his organization's smaller size might limit the scope of his management skill set. "The ability to build consensus, foster teamwork and effect change at all levels of an organization are skills that are in demand at every organization," he says. "I believe future employers will measure my abilities by my successes, not necessarily the size of the organizations I have worked in."

Touchstone Behavioral's Porter agrees, saying he envisions numerous future career opportunities; these could include pursuing another CIO role at a slightly larger company, or branching out on a big-company track as an IT leader in a business unit reporting up to a division head or CIO, or taking ownership of a focused enterprise team in applications or infrastructure.

"I think the opportunities are there," Porter says. "It's fairly obvious I'm not going to get the call to take over HP, but I wouldn't want that call. It's a whole different set of headaches." ◆

Stackpole, *a frequent* Computerworld *contributor, has reported on business and technology for more than 20 years.*

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Security Manager's Journal

MATHIAS THURMAN

Getting Validation at RSA

The annual conference offers a chance to compare notes with other security professionals.

MY MECCA is the RSA Conference, which this year was held the last week of February in San Francisco.

Every year, this conference lets me meet up with past bosses, colleagues, schoolmates and other security-minded folks. We catch up on a personal level and freely discuss any and all security topics. I also enjoy having all the vendors — major as well as up-and-coming — in one spot. And the various breakout sessions and keynote talks teach me something new or, even better, validate my security program and priorities.

RSA can be overwhelming if you don't plan ahead. Every year, I look for interesting breakout sessions and list the vendors I'd like to meet with. And I enter the conference with a focus on several pressing issues.

This year, the first issue was BYOD. My CIO wants the IT department to let employees use their own devices for business. I've had misgivings about this from the beginning, and the consensus that emerged from several sessions, meetings with vendors and discussions with other professionals was that BYOD is not sustainable. There are just too many problems that an IT department with strained resources has to handle: support, compatibility with existing infrastructure, the danger of losing intellectual property and the difficulty of securing the devices. Technologies like virtual desktops can help enable BYOD, but at the end of the day, most of us security folks are shying away from this trend — at least for the moment.

A related issue was mobility. Employees are itching to get their iPads, Androids and other tablet devices on our networks. Most of the security people I talked to agreed with me that there are significant security concerns, but in this case, the overwhelming feeling was that enabling mobile devices is a problem that needs to be solved. Face it: Employees are figuring out risky work-arounds, such as syncing their corporate files to cloud file-sharing sites and accessing sensitive files (source code, financial spreadsheets, customers' personally identifiable information, healthcare data) from their mobile and other noncorporate, untrusted resources. Better to come up with a more secure approach and cut off these riskier tactics.

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Then there's cloud computing. My company is deploying single sign-on for cloud applications. It's very convenient, of course: You just enter your credentials one time and *voilà* — you have seamless access to dozens of corporate and personal applications. At RSA, I quickly found out that I'm not alone in my view that this convenience is fraught with peril. Say an employee's credentials are compromised by a keylogger on an untrusted kiosk; his corporate and personal life is compromised as well. Two-factor authentication would help, but it's not universal yet, and some vendors have a sketchy idea of what is needed in two-factor authentication, which should be in the form of a one-time password containing something you have and something you know. For example, one company requires a username, a password and a single security question and calls that two-factor. Sorry, but no. A keylogger can grab all of that.

Speaking of the cloud, I talked to a lot of people about my new policy of locking down Salesforce.com, and almost all of them agreed that access to software-as-a-service applications that contain sensitive corporate data should be restricted by IP address. So, more validation!

Another thing I looked into was security-awareness training. One company that piqued my interest was Green Idea, which has created some entertaining, security-related screen savers.

Now I'm back in the office with a fresh supply of vendor-branded pens, but also a lot of brochures and business cards that should help me continue to raise the security bar for my company. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

Trouble Ticket

At issue: You can't attend the annual RSA Conference without planning ahead.

Action plan: Enter the conference armed with questions on BYOD, mobility and the cloud.

"At RSA, I can catch up with past bosses, colleagues and other security-minded folks."

Discussion Underway

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S.J. VAUGHAN-NICHOLS

Does VMware Have a Real Future?

> Price is a big weakness when every player in the virtualization market is offering a free option.

WE ALL KNOW that technologies come and go. Sometimes, technology companies do the same thing. I've long thought that VMware's days were numbered, and not because there's anything wrong with its technology.

VMware has dominated the virtualization market ever since that market came into being. It has done so the old-fashioned way: by offering good software and support. What could go wrong? Well, price is a big weakness when every player in the market, VMware included, is either offering a free virtualization program or baking one into their operating systems. It's hard to compete with free.

Though VMware provides its low-end offerings for free, it can't stay in the game by relying on those alone; it makes its money exclusively from selling high-end virtualization and virtualization management software. Unlike its competitors, VMware doesn't have much of a revenue stream from operating systems and other products. And when it attempted to overcome that weakness, it was blindsided. More on that in a bit.

VMware's biggest problem is one that has laid other companies low: Microsoft. Slowly but surely, Microsoft's Hyper-V has been making gains against VMware's ESX. Gartner projects that in 2012, Hyper-V will account for 27% of the market, up from 11% two years ago. Within that projected 27%, Gartner says Microsoft will take 85% of all small businesses that use virtual servers.

On top of that, Windows 8 Server boasts a greatly improved version of Hyper-V. Enterprise customers who believe they can't go wrong buying Microsoft are going to start asking why they need VMware as they move to Windows 8 Server.

But Microsoft isn't the whole story, not even when you throw its buddy Citrix, with XenServer, into the mix. Multiple big IT vendors, including IBM, Hewlett-Packard, BMC Software, Intel and Red Hat, have banded together in the Open Virtualization Alliance to promote an open-source virtualization platform — Kernel-based Virtual Machine (KVM) — as an alternative to VMware.

KVM has been maturing. Red Hat's third version of its KVM-based Red Hat Enterprise Virtualization program is greatly improved. Some experts, like IDC analyst Gary Chen, think it has what it takes to compete. And, of course, Red Hat is the Microsoft of the Linux market.

VMware has acted as if it, too, can see what's coming. It wisely tried to get into the operating system game by buying Novell and its SUSE Linux distribution, but at the last minute, dark horse Attachmate swooped in and snapped up Novell. How could sleepy little Attachmate pull this deal off? With a lot of help from Microsoft, that's how. To my mind, that incident suggests that Microsoft still knows how to play hardball. Or maybe the operative metaphor is chess; Microsoft was looking several moves ahead. It didn't want VMware to be able to combine its strong virtualization portfolio with a strong business Linux server.

And so, today, VMware is sitting exposed, despite retaining a huge market-share edge in the virtualization market. It's in a weak position because it can't offer customers a complete virtualization/operating system vertical stack.

Of course, VMware will say its rivals' commoditized virtualization hypervisors aren't nearly as good as its polished programs. That may be so, but it doesn't really matter when what the competition is offering for free is good enough. That's a deal that's awfully tough to beat. ◆

Steven J. Vaughan-Nichols has been writing about technology and the business of technology since CP/M-80 was cutting-edge and 300bps was a fast Internet connection — and we liked it! He can be reached at sjvn@vna1.com.

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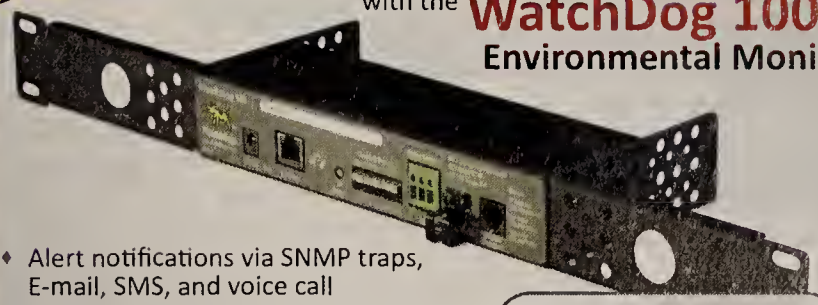

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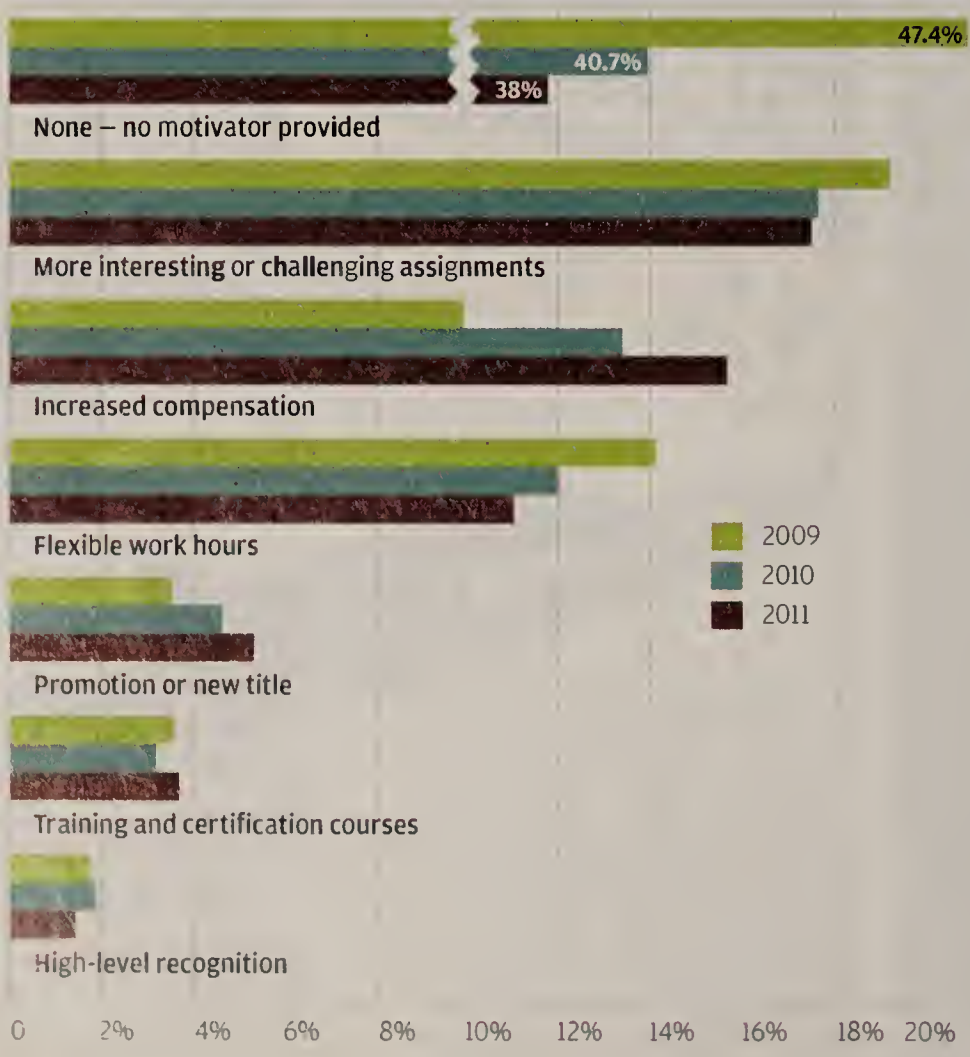
Career Watch

Green With Motivation

Among the interesting bits of information contained in Dice's annual salary survey was data suggesting that employers are doing more to hang on to talented IT staffers. In the 2011 survey, the percentage of respondents who said they were given no motivation was lower than it was in 2009 and 2010. And when respondents were asked to name their primary motivators, the percentages of those who cited increased compensation or a promotion or new title were higher this year than in the past. Dropping as primary motivators were more interesting or challenging assignments and flexible hours.



SOURCE: 2012 DICE TECH SALARY SURVEY, CONDUCTED ONLINE WITH 18,325 EMPLOYED TECHNOLOGY PROFESSIONALS IN THE FALL OF 2011

ASK A PREMIER 100 IT LEADER

Linda Zafonte

The CIO at the NYS Insurance Fund answers questions about **bailing out on a 'toxic' workplace** *and more.*

I work in a smallish IT department, and I've always liked it. A few months ago, a big wave of layoffs took us from about 50 employees to under 40, and a new CIO was brought in. Now the atmosphere seems toxic, with suspicion and backbiting replacing our old camaraderie. Can this situation be turned around, or should I bail out? A decision to leave or stay at a company should take multiple factors into consideration. If you were previously satisfied with your employer and challenged in your position, it would be best to wait and see if things calm down. You could also approach the new CIO and ask how you can help him achieve his objectives. This would help you see the larger picture, and it could position you to become a trusted member of the new CIO's team.

My company's attitude toward training is that IT employees make good salaries, so we should be able to pay our own way. And we should invest in ourselves if we want to stay employed. Needless to say, this is an unpopular policy, and I know many good people who have left because of it. Personally, I don't like to give up without a fight. How can I, one IT director among many, effect change? Has anyone tried to present training in terms of the return on investment? It's always good to use data as a means to persuade. I would consider doing a comparison of the costs of internal full-time employees vs. the costs of consultants, if this is relevant to your company. Also, how does the attrition rate in IT compare to the rate in other departments? And how much does it cost to recruit new employees (in terms of advertising, website services, placement fees, etc.)?

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com**, and watch for this column each month.

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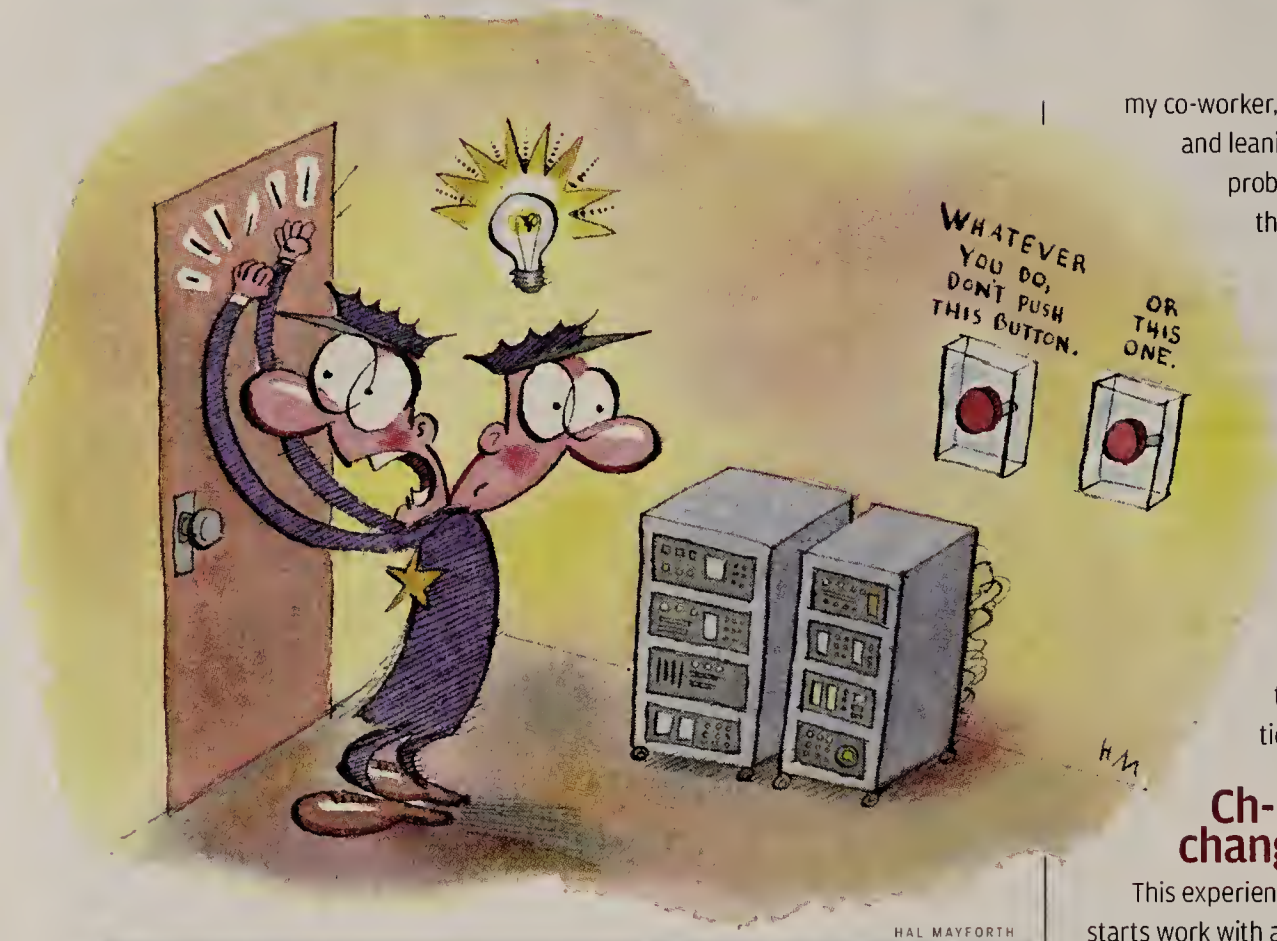

HAL MAYFORTH

Don't Push That Button!

This credit-card processing company has a major data center outage, and recovery requires half a day and thousands of IT people. The root cause? "It seems that a minimum-wage contract security guard had let a technician into the data center," reports a pilot fish on the inside. "When the tech left, the security guard found himself stuck in the data center and couldn't figure out how to get out. Figuring he could set off some alarms and someone would come get him, he went to a wall with big signs that said 'Only press in case of an electrical emergency,' lifted a cover and hit the big red button. No one came to get him, so he did the same thing with another button. That was a scenario our recovery plans hadn't considered – that someone within the data center would kill the primary and secondary power."

Fun With the Rookie

It's the first day at the first job for this fresh-out-of-college programmer pilot fish. "I arrived at my desk expecting to read documentation until somebody had time to show me what the team does," says fish. "Instead, I got my first assignment from my boss and was told not to worry – it wasn't due until 3:15. It was already 1 p.m. I started furiously making my changes and trying to get them tested. A co-worker asked me what I was working so hard on, and I explained the task and that it was due by 3:15. He nodded his head knowingly and said, 'Ah, March 15, huh?' I stopped and turned to fully look at my co-worker, who was smiling and leaning back in his chair, probably thinking of all the fun they were going to have with this greenhorn. I was mostly done with the changes anyway, but it was nice to have a little breathing room to get everything done correctly. And after that, I learned to clarify expectations a lot better."

Ch-ch-changes

This experienced IT pilot fish starts work with a big company, and that requires a few changes for him. "The largest hurdle has been adjusting to the red tape of a full-blown change management system," fish says. "I had to submit an emergency change one day – a case where I was permitted to take action and submit the paperwork after – so I shut the server down, brought it back up, and filled out the emergency request. I explained that we had a hung server and performed an emergency reboot. The approval request was quickly denied by one of the top technical authorities at the company. The reason given was that I had not included a back-out plan for a server reboot. For some reason, my college degree and certification paths never made mention of how to 'un-reboot' a computer."

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APC 13
Cisco 2
dtSearch 43
Hewlett-Packard 9
IBM Non-Intel 23
IBM Intel C4
InterSystems 7
Invest in Ontario 27
IT WatchDogs 43
Microsoft Cloud 35
Microsoft Office 365 15
Motorola 4-5
Numara Software Now Part of BMC. 29
Quest Software 19
SonicWALL C3
Verizon Wireless 25
VMWare C2-1

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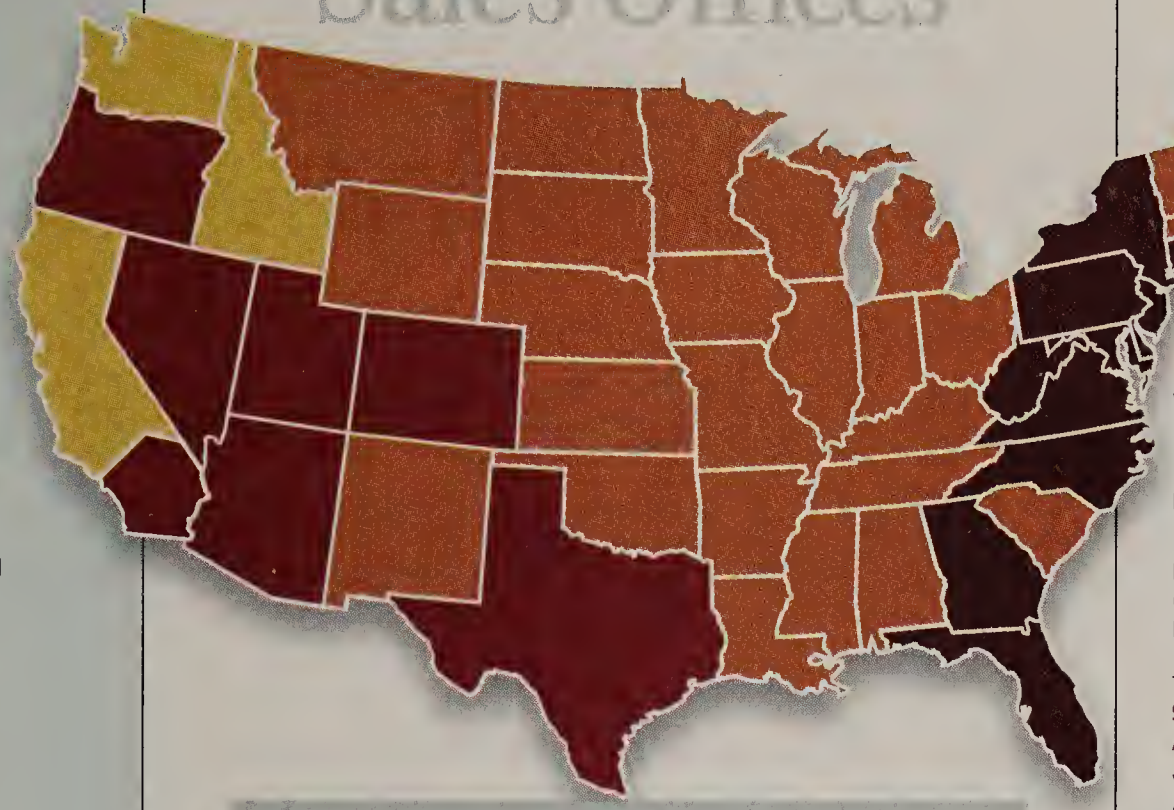

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SCOT FINNIE

Are Tablets Inevitable As PC Replacements?

> Desktop and notebook PCs aren't even close to being dead yet.

THE TABLET PHENOMENON is bigger than you probably realize. Before the "new iPad" debuted, Apple announced that it had sold 55 million of its tablets to date. Apple CEO Tim Cook helped put that figure in perspective at a conference in February: "It took us 22 years to sell 55 million Macs," he reportedly said. "It took us about five years to sell 22 million iPods, and it took us about three years to sell that many iPhones." The fact that the iPad sold 55 million units in less than two years tells us something: Tablets are a runaway success.

Indeed, IDC in February forecast rapid growth in sales of Android tablets as well as continued sales growth for iPads. The market research firm forecasts that just under 90 million tablets will be sold worldwide this year. In 2015, according to IDC, tablet sales will come within striking distance of 140 million, with Apple's iOS capturing 51% of sales and Android grabbing 47%.

Do those numbers make you think PCs are dead? Actually, sales of PCs are growing modestly. According to a March 2012 Gartner report, global PC shipments are expected to hit 368 million units this year, for a 4.4% increase over last year. Gartner also expects the PC market to be stronger in 2013, with sales projected to reach 400 million units. Desktop and notebook PCs aren't even close to being dead yet.

One reason is that tablets don't perform all PC functions well. Anyone who uses a notebook PC several hours a day to read email, surf the Web, edit documents, spreadsheets and presentations, and work with enterprise apps — and that describes a lot of people — makes heavy use of a keyboard. Most tablets provide virtual keyboards, which are only barely adequate for long-duration touch-typing. Tablets were not designed for typing. I contend that until tablets offer lightweight and compact add-on keyboards, business tablet users will for the most part need notebook or desktop PCs too.

I had intended to focus a bit more on Apple's "new iPad," which was arriving on U.S. shores as I began to write this column. But truthfully, I'm somewhat ambivalent about the third-generation iPad. The high-resolution display is a clear improvement. But when all is said and done, what this new iPad will likely be remembered for is that it sold in even greater numbers than the iPad 2 did.

I think broader market dynamics are a more compelling story. The dramatic uptake on tablets, for both consumer and business use, is a clear indicator that, while the PC isn't dead, its days are numbered. Evidently there's pent-up demand for a device that is grab-and-go portable and that can be used just about anywhere, conveniently. And that need dovetails nicely with the proliferation of location-based app services.

If you think of them as take-anywhere versions of notebook PCs, tablets are merely the next rung on the 30-year evolutionary ladder that has included tower desktop machines; luggable, sewing-machine-size "portables"; and 7-lb. notebook PCs. The PC has been getting smaller since its inception, and the tablet is the next iteration.

What am I driving at? I think tablets are growing at such a prodigious rate that they can't help but have a greater-than-the-sum-of-its-parts effect on computing; IDC's prediction that tablet sales will hit nearly 140 million units in 2015 strikes me as conservative. PC makers have no interest in seeing the PC die off. But the market is speaking loudly and clearly. ◆

Scot Finnie is *Computerworld*'s editor in chief. You can contact him at sfinnie@computerworld.com and follow him on Twitter (@ScotFinnie).

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[1]TBR 3Q11 x86-Based Servers: Corporate IT Buying Behavior & Customer Satisfaction Study, November 2011.

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